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PLAGUE: RECENT PROGRESS IN ETIOLOGY, PATHOLOGY AND TREATMENT.

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When writing on recent advances in our knowledge of cholera reference was made to a useful Report, issued by the Ministry of Health. From it statistics were taken for the world incidence of plague from 1914 to 1917 [Bruce Low (1920)]; and it will not be necessary to include them in this Review.

Of the bacillus found in buboes by Yersin and Kitasato in 1894 there is little to be said. It has, however, been shown by Epstein (1921) that bi-polar staining, a marked feature used for diagnosis in text-books, is not a phenomenon confined to *B. pestis* and the group to which it belongs. Among other conditions, the method of fixing the specimen influences the result. The organism is non-sporing and non-motile and so far bacteriologists have not confirmed the finding of flagella as seen by Gordon. Swollen involution forms are said to occur; but they are rare.

Among those who suffer are rodents, fleas and man. It has been long known that *Mus rattus*, *M. decumanus* and *M. musculus* were liable to epizootic outbreaks and the finding of their dead bodies generally precedes an epidemic among human beings. Of late years many other rodents have been found liable to plague: the tarabagan, *Arctomys bobac*, and the smaller marmot, *Spermophilus citellus*, in China, etc., and also the ground squirrels in California [Harrison (1920)]. Wu Lien Teh (1921) has proved that both the marmots easily succumb to pneumonic plague produced by inhalation of *B. pestis* in spray. McCoy (1921) writes: "We have had natural infection among the ground squirrels (*Citellus beechyii*) of California, the black rats (*Mus rattus*) of Hawaii, one species of wood-rat (*Neotoma*), and a field rodent in Louisiana." Last year L. G. Haydon (1921) reported sporadic outbreaks of plague in the Union of South Africa. The Central Health Department, not being certain as to the source of infection, caused specimens of all rodents in the affected region to be collected. A long list of the captured animals is given. Two, the gerbille (*Tatera lobengulae*) and a multimammate mouse (*Rattus coucha*) were infected with *B. pestis* and showed a very heavy mortality over

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a wide area. In a paper read before the Academy of Sciences, Paris, on February 6, 1922, LEGER & BAURY (1922) stated that in Senegal the shrew (*Crocidura stampflii*) "played a part" in the Dakar epidemic "different to that of the rodents, but not without importance." Living in houses in company with rats, it will receive infected fleas deserting the dead and dying rodents. *X. cheopis* was most commonly found on the shrews, and some of these animals are reported to have died of plague. Shrews consorting with rodents during an epidemic should, therefore, be destroyed. In Bengal (Dacca) *X. cheopis* was rarely found on the shrews and they did not suffer from plague. *C. cerulea* is the common species in India. It not only did not suffer from natural infection but resisted inoculation with *B. pestis* (Report of the Indian Plague Commission).

Of all the fleas that may, or do, convey the plague bacillus from the poisoned blood of the rodent to mankind the most interesting are those belonging to the genus *Xenopsylla* (*Leomopsylla*, etc.). They are the special rat fleas in tropical countries and three species are described [ROTHSCHILD (1914)]:—*X. cheopis* Roths.; *X. brasiliensis* Baker (1904) (*vigetus* Roths. (1909)), and *X. astia*. All three occur in India, in the western tropics and in Africa; the syn. *vigetus* was described from specimens sent from West Africa.

Although it had long been known that fleas conveyed the bacillus from rodents to man the exact method was only discovered by BACOT & MARTIN (1914). Previous to their investigations it was thought that infection always took place through scratching the skin at spots upon which fleas had left their excreta. It may be that some infections are thus caused, but the most usual process of introduction of bacilli is by regurgitation of blood. The *B. pestis* multiplies so rapidly in the proventriculus of the flea that after a time it cannot swallow the blood which it is sucking from its victim; blood filled with bacilli thus flows into the bite. For the flea itself the result may be fatal, since it is sometimes choked by the bacterial growth.

The fleas which are found on rodents include others besides those belonging to the genus *Xenopsylla* and BACOT * (1919) has given a full list of them. Flea carriers of plague infection only act mechanically and no change takes places in the bacillus during its life in those insects. Of the three species of *Xenopsylla*, *cheopis* is regarded as the most dangerous. *X. brasiliensis* does not readily bite man and *X. astia* bites man with great reluctance at temperatures over 80° F. [PHILIP & HIRST (1917)]. CRAGG (1920) examined 4,270 fleas collected from 18 areas in India:—64 per cent. were *cheopis*, 29·8 per cent. *astia*, and 2·7 per cent. *brasiliensis*, while 2·89 per cent. belonged to the genus *Ceratophyllus*. In the Punjab, where there is much plague, *cheopis* predominates:—Rawalpindi, 92·8 per cent.; Ludhiana, 93 per cent.; Sialkot, 85 per cent.; Jullander, 73 per cent.; and Jhelum, 86 per cent. From each of these places a few *astia* were sent; *brasiliensis* was absent. Fleas from Akyab, Burma, which has never been invaded by plague, were 98 per cent. *astia*.

Of the three types of plague—bubonic, septicaemic and pneumonic—all may be started by fleas, but pneumonic plague is known to spread from man to man without their intervention. This form of plague is best known from North China, where the cold is often intense and the marmot trappers live crowded together in underground, ill-ventilated

* The death of this investigator is a great loss to tropical medicine; he was an indefatigable worker and an entomologist to the manner born.

rooms [Wu Lien Teh (1921)].* This form of malady is well described in reports written by the Medical Inspector of French Colonial Troops in Madagascar [Allain (1921)]. The report which refers to the small outbreak of pneumonic plague at the end of June, 1921, should be carefully read. It shows how difficult it may be to diagnose pneumonia due to *B. pestis*, even when other forms of plague have occurred not far away. There were 46 deaths (100 per cent.) from "foudroyant pneumonia" during the coldest time of the year, when penumonia was common. Dr. Allain is an earnest advocate for antiplague serum in treatment and antiplague vaccine for protection. Cintra (1920–21) reported "a somewhat anomalous epidemic, at first thought to be influenza pneumonica," in S. Paulo, Brazil. The virulence of the infection and the rapid mortality pointed to plague. Examination of the fatal cases resulted in finding a Gram-negative germ resembling *B. pestis*. Plague was killing rats in S. Paulo at that time (*l.c.*). Williams (1920), writing of pneumonic plague in North America, says:—"Plague pneumonia differs from other forms of pneumonia in three points: after sudden onset, the patient is extremely prostrated with almost no chest signs; by the time the definite involvement of the lungs is demonstrable the patient dies. The sputum is watery, never thick and tenacious, and soon becomes very bloody."

Papers by Symmers (1918) and Lee (1919) give a good résumé of the difference between plague pneumonia and the same disease due to influenza. Symmers found that whereas in pneumonia of influenzal origin the pleural cavities are usually free from fluid, in plague pneumonia there is nearly always pleural effusion. He states that in 25 necropsies, carried out by Crowell, on subjects dying during a Manchurian epidemic, copious pleural effusion was present in every case. Another point noted is the absence of vesicular emphysema in pneumonia due to *B. pestis*. Lee notes the absence of sneezing, etc., accompanying influenzal pneumonia. In plague pneumonia as observed by him the onset, with high temperature, was rapid. Only a few hours passed before the appearance of bloody sputum; 60 per cent. of the patients died within 48 hours, 16 per cent. within 24 hours. Only two patients recovered out of 72,000.

Of the septicaemic type there is nothing of importance to be recorded. It is very fatal and Dr. Jackson (1917) records cases in which men, apparently in good health, were infected and died within an extremely brief period of time. It was no doubt this sudden death in virulent plague septicaemia which gave rise to the story that the catastrophic decease of the Assyrian army was possibly due to that malady.

The rat being an animal that keeps mainly to the ground, infected fleas quitting them generally bite human beings about the legs. Thus the buboes usually alluded to are those in the groin. With the wider spread of the disease we find that when the epizootic starts among marmots and squirrels which are handled and skinned, buboes form in the axilla and cervical region. It would seem also that in such cases the mortality is likely to be higher than in cases where buboes are confined to the groin. That this is so is shown by Monziol & Colignon (1920) and in the cases seen by them the source of infection was *M. rattus*. They observed 44 cases of plague among the civil

* See also "Practice of Medicine in the Tropics," Vol. 2, p. 1041, where a photograph of such a room in an underground inn is shown.

population of Constantinople. In seven only was blood culture positive between the first and sixth day, and of these seven only one recovered—a man with a bubo in the right groin and a positive blood culture on the sixth day. They state that the gravity of the malady varied with the localization of the buboes :—3 cervical with 2 deaths ; 5 axillary, 5 deaths ; 35 inguinal, 10 deaths. W. T. HARRISON (1921) also points to the greater danger when the buboes are in the upper part of the trunk :—During an epidemic in San Benito, California, Dr. BANNON employed large doses of antiplague serum, and by prompt treatment saved a boy of eight. This, it is noted, was the more satisfactory as the bacilli had settled in the glands of the axilla and scapular region. McCOY (1921) says that "human cases, traceable to squirrels, almost always have the peculiarity of having the primary buboes in the axilla, due, of course, to the fact that in the handling of infected squirrels, dead or alive, the fleas attack the upper extremities, while when the disease is contracted from rats the chances are that infection will be through the skin of the feet or legs." Certain anomalous and unusual conditions in which the plague bacillus has been found in the skin or subcutaneous tissues with marked oedema [PATANE (1919) ; DELAMARE (1922)] are recorded ; also cutaneous pustular eruptions [ARAUJO (1921) ; ALVARADO & BACA (1919)].

Perhaps the most satisfactory feature observed as one looks back through the years since 1914 is a certain amount of proof that we possess a useful therapeutic agent in antiplague serum and a valuable prophylactic in antiplague vaccine. Dr. JACKSON (1917) wisely points out that if there is a disease in which early treatment is of value it is plague. He has had good results with the serum and, indeed, apart from it there does not seem to be any treatment for plague, especially the septicaemic and pneumonic types. KRAUS (R.) (1919) considers that antiplague serum prepared with dead bacilli gives the same results as serum prepared with live germs. He states that large doses can be given intravenously without danger and with excellent results. Valuable testimony comes also from Texas where of ten cases receiving serum only two died [LEVY & MCMICKEN (1920)]. From Tunis comes a paper by GOBERT (1921) in which he states that antiplague serum was reported by the medical officers of the various regions to be distinctly useful. From Dr. CAMPAIGNOLLE's report he quotes :—"I had 100 per cent. mortality among the unvaccinated and among those who received serum too late. Among 16 patients, some vaccinated and others treated at once with serum, there was only one death." Dr. ALLAIN's advice with regard to serum and vaccine will be found on pp. 370–371 of Vol. 19. There are still investigators who, forgetting HAFFKINE, are compelling guinea-pigs or rabbits to produce antibodies in response to their own particular brand of antiplague vaccine. We do not know how long artificial immunity to plague lasts ; but reference to volumes of this *Bulletin* will show that the antiplague vaccine is much used in the tropics and there are many testimonials to its value.

Among other methods of reducing plague are the destruction of rats and fleas and the building of rat-proof houses. We have yet to discover the best way of abolishing rats and there is little chance of complete success. Where "deratization" is most necessary is on ships, especially those ships which carry grain or food in bulk.

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* References are to summaries in the *Tropical Diseases Bulletin* unless otherwise stated. Dates in parentheses refer to year of publication of original papers.

KALA AZAR.

i. NAPIER (L. E.). **A New Serum Test for Kala-Azar.**—*Indian Jl. Med. Res.* 1922. Apr. Vol. 9. No. 4. pp. 830–846. With 1 plate.

ii. MILLS (P. S.). **Note on the Formalin Test as applied to the Diagnosis of Kala-Azar.**—*Indian Jl. Med. Res.* 1922. Apr. Vol. 9. No. 4. pp. 847–849.

i. Attention has already been called to the new formol-gel test for kala azar (this *Bulletin*, Vol. 19, p. 4) as described by SPACKMAN and Napier. In this paper the author goes more fully into the question. The reaction depends not on the gel formation, but on the white opacity which appears. Accordingly the author thinks that the name "Formol-gel test for kala azar" is inappropriate and proposes the term "Aldehyde test."

To carry out the test, 5 cc. of blood is drawn from the vein and allowed to stand till serum separates. Of this 1 cc. is placed in a small test tube half an inch in diameter, and after the addition of one drop of commercial formalin (30 per cent. formaldehyde) the tube is well shaken and kept at laboratory temperature. Within a minute or two the serum will have set so that the tube can be inverted. It will then begin to show a whitish opalescent colour. After 3 to 20 minutes the whole of the serum will have become absolutely solid and opaque, like serum coagulated by heat or the "white" of a hard boiled egg. If the serum is blood-stained it will have a pink tinge which will turn chocolate brown after 24 hours.

A large number of controls have been carried out and these have shown that in some diseases the serum will solidify in half an hour, or even less, while some degree of opacity develops after a few hours. The serum of healthy persons remains clear and fluid for an indefinite period. In the case of young children with kala azar the opacity may not be complete, but in other diseases of children there is not even a partial opacity as seen in adults.

Two exceptions are mentioned of cases of malaria with large numbers of parasites in the blood. The sera of these solidified in a few minutes and developed a marked degree of opacity. After standing 24 hours, they had a characteristic greenish tinge which made them easily distinguishable from kala azar sera.

An attempt was made to gauge the degree of opacity. A small cylindrical cell measuring 1·25 cm. in diameter, 0·4 cm. in depth, and having a capacity of 0·5 cc., was used. The Thoma-Zeiss haemocytometer white blood corpuscle pipette also has a capacity of 0·5 cc., and this is employed to take up 1 part of 20 per cent. formaldehyde and 10 parts of serum. The contents are immediately expelled into the cell, which is placed over some standard print. The time taken for the opacity to develop to the extent that the print becomes unreadable is noted. In the two malaria cases noted above the print was still decipherable after 24 hours, whereas in all cases of untreated kala azar it was unreadable in from 3 to 20 minutes, or, exceptionally, in two hours.

In 150 cases where the condition simulated kala azar and in which satisfactory spleen puncture was carried out the aldehyde test corresponded with the puncture findings in 98 per cent. The details of these cases are set forth in tabular form. The aldehyde test was compared with the Wassermann reaction in 86 of the 150 cases.

Of 60 which gave a positive aldehyde test 12 gave a positive Wassermann, 7 a partially positive one, and 41 a negative reaction. Of 26 which were negative to the aldehyde test 4 were positive to the Wassermann test, 5 partially positive, and 17 negative.

A further series of 50 controls of persons suffering from various diseases is given in another table. It was only in tuberculosis and leprosy cases that any clouding of the serum occurred.

The test was then applied to a series of cases of kala azar undergoing antimony treatment. Of 29 cases thus tested it was noted that there was a definite tendency for the reaction to disappear, so that the progress of the patient can be measured in an accurate manner.

The best method for carrying out the test is that described above, but various modifications are suggested in which blood is taken from the finger. The best of these is as follows :—Four drops of blood are taken from the patient's finger into a small test tube containing 0·5 cc. of citrate saline solution (sodium chloride 0·85 gm., sodium citrate 0·5 gm., water 100 cc.) in which there is one drop of formalin ; if this is left overnight the red blood cells settle and the supernatant fluid will be milky in kala azar cases and clear in others.

The chemistry of the reaction is not obvious. It was found that a pure solution (10 per cent.) of formaldehyde specially prepared in distilled water gave clearer results than the commercial product. One drop of this is added to 1 cc. of serum. The reaction is essentially an aldehyde one, as acet-aldehyde also gives the reaction but less completely and more slowly than the lower aldehyde.

A coloured plate illustrating the test accompanies the paper.

ii. In this note on the formol-gel test for kala azar the author mentions that it was carried out in eleven cases in which spleen puncture was done. In five cases both the formol-gel test and the finding of leishmania in spleen smears were positive, while in six both were negative. In one of the negative cases the serum jellied in 30 minutes, and Napier adds a note to the paper stating that he has also seen such cases where there is delay in the solidification of the serum.

C. M. Wenyon.

Ganguly (L.). [**The Formol-gel Test in Kala-Azar.**] [Correspondence.] — *Indian Med. Gaz.* 1922. Feb. Vol. 57. No. 2. p. 77.

The letter is an account of the author's experience with the formol-gel test in kala azar as advocated by Spackman and Napier (this *Bulletin*, Vol. 19, p. 4), and Fox and Mackie (Vol. 19, p. 310). It was found that in some verified cases of kala azar the serum did not become both opaque and jellied in five minutes and that it often jellied earlier than it became opaque. In all cases a jelly was formed in ten minutes, but in only six was it completely formed in five. In only two cases was complete opacity present in five minutes and in only four in ten minutes. In a case of syphilis the serum was completely jellied and opaque in ten minutes.

C. M. W.

Christopherson (J. B.). **The "Blue Bodies" in Leishmaniasis.**— *Proc. Roy. Soc. Med.* (Sect. of Trop. Dis. & Parasit.). 1922. Apr. Vol. 15. No. 6. pp. 21–24.

The paper describes certain blue bodies which the author has seen in smears of Oriental sore. He states that they are constantly present

and are an aid to diagnosis in that, when seen, they justify the assumption that further search will lead to the discovery of leishmania. They are usually about the same size as the parasite, but may be larger or smaller. Some of them have the appearance of blue rings. One or two red dots may be present. The origin and significance of these bodies is discussed. Some may be portions of the cytoplasm of the large cells, others may be derived from the leishmania themselves. It is evident that many leishmania ultimately disappear in the body and it is suggested that some of the blue bodies may represent stages in the degeneration of the parasites. It was found that if the flagellates in cultures were treated with tap water they became spherical, lost their flagella, and, when stained, had a remarkable resemblance to the blue bodies as found in smears of Oriental sore.

C. M. W.

Young (Charles W.) & van Sant (Helen M.). **The Diagnosis of Kala-Azar by Blood Culture.**—*Proc. Soc. Experim. Biol. & Med.* 1922. Mar. 15. Vol. 19. No. 6. pp. 299–302.

By adopting a special technique, the authors have succeeded in obtaining cultures of leishmania in nine of ten samples of the peripheral blood from five cases of kala azar in North China.

Since the authors believe, as others have done, that excess of human serum is detrimental to growth, the blood (10 cc.) drawn from the vein into a syringe containing 2 cc. of Locke's solution was at once transferred to a flask containing 50 cc. of the same solution. This was centrifuged at low speed to bring down the red cells only. The supernatant fluid was then centrifuged at high speed and the deposit of leucocytes distributed in tubes of N.N.N. medium. The latter differed from that usually employed in that 0·2 per cent. potassium phosphate (K_2HPO_4) was added as a buffer. The salt-phosphate agar was adjusted to P_h 6·8 to 8·2. It is claimed that in this medium the growth is better and persists longer than in medium containing no buffer.

A positive culture from the peripheral blood was obtained in two cases after intravenous treatment with colloidal antimony had been in progress some time—one case had received during 14 days 121 cc. of the suspension, equivalent to 0·173 gm. of metallic antimony. Eight hours before the culture was made 20 cc. had been administered intravenously. The second case had received 377 cc. of the suspension of antimony during the 33 days preceding the culture. The last dose of 30 cc. had been given three days before the culture was made.

C. M. W.

Gupta (Biraj Mohan Das). **A Note on Some Cultural Phases of *Leishmania Donovani*.**—*Indian Jl. Med. Res.* 1922. Apr. Vol. 9. No. 4. pp. 809–813. With 1 plate.

The paper records the results of the experimental inoculation of a monkey with kala azar. The interesting feature of the infection was that attempts to find parasites in films of the peripheral blood, liver and spleen puncture material of the monkey failed entirely, whereas cultures from the spleen and liver material were positive on three occasions.

Some peculiarities of the cultures are recorded, and the author believes he has seen cysts which contain a number of flagellates which eventually escape. In the fresh condition the cysts measure 12μ in

diameter and are packed with what are called " tiny and very active 'second generation' flagellates." [It is difficult to form an opinion as to the real nature of these cysts, which, being of the size mentioned, can hardly have been formed by the rounding-off of even the largest of the flagellate stages. The reviewer has never seen cysts in cultures at any stage, and it occurs to him that they may be globules of material containing numerous flagellates.]

C. M. W.

Franco (E. E.). **Anatomia patologica della leishmaniosi infantile.**—*Arch. Portugaises des Sci. Biologiques.* Lisbon. 1922. Vol. 1. No. 1. pp. 31–95 With 3 plates.

This long paper of over 60 pages contains a detailed study of the morbid anatomy and histology of cases of infantile kala-âzar in Portugal. The reviewer cannot find in it any essentially new information and the two plates showing sections of the organs and cells infected with leishmania are very similar to those published by other observers. As in another paper by the same author reviewed in this *Bulletin*, the terms employed for the cells are quite unfamiliar to the reviewer.

C. M. W.

Franco (Enrico Emilio). **Sulle leishmaniosi. Relazione al Congresso Luso-Spagnuolo di Porto—Giugno 1921.**—Reprinted from *La Med. Ital.* Milan. 1922. Feb. 28. No. 2. 4 pp.

——. **Hémo-histioblastes et leurs dérivés monocytiques, lymphocytiques et granulocytiques dans la rate et dans le sang circulant d'enfants atteints de leishmaniose.**—Reprinted from *Jl. Sci. Mat. Fis. e Nat.* Lisbon. 1922. 3rd Ser. No. 9. 6 pp.

The greater part of the first of these papers is very similar to the one reviewed in this *Bulletin* (Vol. 19, p. 309). It contains some statements on the nature of the cells which are infected with leishmania, a subject which is discussed more fully in the second paper. The author believes that the large cells (macrophages), which contain leishmania in the spleens of cases of kala azar, are of two types. He discusses these cells, their origin and fate, and in so doing employs terms such as hémo-histioblastes of Ferrata and polyblasts of Maximow, which may be familiar to students of applied haematology, but hardly so to the majority of the readers of this *Bulletin*.

C. M. W.

Franco (E. E.). **Leishmaniosi viscerale dell'adulto (Kala Azar).**—*Pathologica.* 1922. Apr. 1. Vol. 14. No. 321. pp. 193–196.

A case of kala azar in an adult negro, 24 years of age, who had lived in Portugal since the age of two. The diagnosis was first made by the discovery of leishmania in the peripheral blood during an examination for malarial parasites. The condition of the blood is described in detail and the cells of the spleen which were infected are regarded as of a different type from those which contain parasites in infantile cases of the disease.

C. M. W.

D'OELSNITZ, BALESTRE (P. L.) & DAUMAS (A.). **Un nouveau cas de Kala-Azar infantile en France.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1922. Apr. 6. 38th Year. 3rd Ser. No. 12. pp. 550–553.

Infantile kala azar was first shown to exist in France by LABBÉ, TARGHETTA and AMEUILLE, who discovered two cases among Serbian refugee children at Nice (this *Bulletin*, Vol. 12, p. 198). There was reason to believe that the disease was locally contracted, and this is borne out by the authors of the paper under review, who have met with another case in the same locality, which they now record. Diagnosis was established by spleen puncture. There appear to be no features of special interest in this case, which proved fatal owing to its advanced stage when first seen.

C. M. W.

NAPIER (L. E.). **Kala-Azar: A Preliminary Note on the Treatment by the Intramuscular Injection of a Special Preparation of Sodium Antimonyl Tartrate.**—*Indian Med. Gaz.* 1922. Jan. Vol. 57. No. 1. pp. 10–16. With 4 charts.

In the opening remarks of this important communication, the author points out that when the compilers of the British Pharmacopoeia laid down the necessary standard of purity for sodium and potassium antimonyl tartarate it was not realized that these compounds would be used extensively for intravenous injections. As some of the samples of the drugs are "heavy" and others "light," and as the residue left after attempted solution varies considerably with different samples, it is evident that the constitution of the drugs as supplied is not constant. The author found that a number of samples varied in appearance, solubility and their power of producing a precipitate in blood serum *in vitro*. It is supposed that this precipitate may account for some of the unpleasant symptoms which may follow intravenous injections.

With one sample which had been specially prepared for intravenous injections there was no residue when attempt at solution in water was made, and, furthermore, this sample produced the smallest amount of precipitate in blood serum.

Experiments on rats were undertaken. Doses of this sample were injected into the muscles of the thigh, and it was found that after 48 hours there was no local inflammation. Tried on himself by subcutaneous injection, the author found that the drug gave rise to a distinct stinging sensation for three minutes, but that after this there was no pain, though a small lump remained which was painful on pressure. Intramuscular injection was much less painful at the time and afterwards. The drug was then tried in cases of kala azar. A 2 per cent. solution in distilled water was employed and a dose rising to 2 cc. was given every other day, commencing with 0·5 cc. The two deltoid and gluteal muscles are used in rotation, so that the same muscle is not used again for eight days. Eleven cases have been treated by this method, and, though the observations have not yet covered a period of more than four months at most, the author feels justified in concluding that at least eight of them may be pronounced as cured, while the other cases are regarded as still incompletely cured.

It is emphasized that this method of treatment was adopted not because it was expected to yield better results than intravenous medication, but that in children and cases with severe lung symptoms it is impossible to give the drug intravenously. The eleven cases treated received nearly 300 intramuscular injections, and in only six instances did an abscess result. It was necessary to open only two of these.

The intramuscular treatment is recommended for the following cases :—

1. Patients who show signs of any marked degree of catarrh of the bronchioles, or who have been previously shown to be liable to lung complications.
2. Patients in whom very small doses of intravenous antimony cause violent coughing and vomiting.
3. Patients with feeble pulses and low blood pressure.
4. Young children with very small veins.

C. M. W.

Samut (Robert). **Colloidal Antimony in Leishmania Infantum.**— *Lancet.* 1922. May 20. p. 995.

The writer treated a case of kala azar in a child 4 years of age in Malta with intramuscular injections of colloidal antimony. The preparation used was one made by Messrs. Chatelain, of the Laboratoire des Colloïdes, 2, Rue de Valenciennes, Paris. The strength of the solution was 0·001 gm. of sulphide of antimony in 1 cc. of distilled water, and 3 cc. were contained in each phial. The contents of one phial were injected on each occasion. The improvement in the child's condition was remarkable, but it died from a severe attack of epistaxis. In spite of this reverse the author is convinced that this method of treatment is a distinct improvement on intravenous injections of tartar emetic.

C. M. W.

i Brahmachari (U. N.). **A New Form of Cutaneous Leishmaniasis—Dermal Leishmanoid.**— *Indian Med. Gaz.* 1922. Apr. Vol. 57. No. 4. pp. 125–127. With 2 plates.

ii. Megaw (J. W. D.). **A Note on a New Disease—"Dermal Leishmaniasis" (Brahmachari).**— *Ibid.* p. 128.

The first of these papers was read by the author at the Medical Section of the Asiatic Society of Bengal on February 8, 1922. In it he describes a new form of cutaneous leishmaniasis which appeared in four cases which had completed a treatment for kala azar six months to two years previously. There was an eruption on the skin which had the appearance of tubercular leprosy. No leprosy bacilli could be found, but the remarkable discovery was made that the skin lesions were due to infection with the parasite of kala azar. All these patients had apparently recovered from kala azar after injections of antimony. The author points out that such treatment of kala azar may have four results. The patient may be cured, he may appear to be cured and then relapse, he may not improve at all, or, finally, after cure of his visceral infection he may develop the curious condition described in this paper.

Details of the fourth case are given and the condition is illustrated by an excellent coloured plate. The case was typical of kala azar, and was treated with intravenous injections of tartar emetic, 30 of

which were given. He was regarded as cured. At the beginning of 1919 (apparently about six months after he was discharged cured) he noticed faint white patches on his face. They gradually spread over the whole body. They were neither anaesthetic nor hyperaesthetic. During the cold weather they became worse, and papillomatous nodules appeared on the face, trunk and extremities. At the time the paper was written the condition of the patient was as follows.

The whole body was covered with eruptions as described below :—

1. On the face papillomatous nodules somewhat resembling small leprotic nodules.

2. Slight erythematous appearance on the cheek and forehead.

3. The trunk and extremities showed slightly raised brown patches. A few papules were also present.

4. On the extremities, especially the lower, erythematous patches.

5. The various lesions showed no tendency to ulceration, and there were no lesions of the mucosae.

There was no constitutional disturbance. The liver and spleen were not enlarged, and leishmania could not be found on spleen puncture. Apart from a slightly lowered haemoglobin index the blood picture was practically normal.

Of the three other cases one resembled that just described, while in the others the rash was limited to the face.

Such cases as these naturally afford a field for speculation as to the relationship of kala azar and Oriental sore. The author concludes that the lesions are caused by *L. donovani*, which had been modified by antimony treatment, and that the virus was attenuated and a deadly visceral leishmaniasis converted into a benign cutaneous form. [It should be remembered that in animals the virus from the spleen of cases of kala azar can produce purely local skin lesions, while that of Oriental sore can give rise to a generalized infection. The author is hardly justified, as the writer of the second paper points out, in concluding that the cases described establish the identity of the parasite of kala azar and Oriental sore.]

ii. The author of the second paper discusses these curious cases. He proposes to call the condition, an instance of which has been seen by his assistant, Post-Antimonial Dermal Leishmaniasis, in place of the name Dermal Leishmanoid suggested by Brahmachari.

[It is perhaps of interest to recall the fact that Christophers in 1904 (*Sc. Mem. Off. Med. & San. Depts.*, Govt. India, New Series, No. 11) described the occurrence of a papular eruption which occurred about the thighs, Scarpa's triangle and scrotum of cases of kala azar. Less commonly it occurred on the trunk, arms and neck. Some of these papules appeared to ulcerate, and in the lesions leishmania were found. It seems not impossible that Brahmachari was dealing with the same condition in an aggravated form.]

C. M. W.

*Connor (F. P.) & Shortt (H. E.). *Leishmania tropica* **Infections in Mesopotamia.**—*Indian Jl. Med. Res.* 1918. Oct. Vol. 6. No. 2. pp. 162–173. With 2 charts and 4 figs. in text.

In this paper the authors write of their experiences of Oriental sore in Mesopotamia during the war. They were able to demonstrate that

* It is regretted that this interesting paper is noticed so late. The title was included in the Lists of References (Vol. 13), but failed to reach the Sectional Editor.—[Ed.]

many of the cases which were diagnosed " I.C.T." (inflammation connective tissue) were actually due to infection with *Leishmania tropica*. It is pointed out that the organism is often very difficult to discover when secondary bacterial infection has supervened. The prevalence of the condition is illustrated by the admissions to a Basra hospital during January, 1918: 307 cases resembled Oriental sore, and of 187 consecutive cases *Leishmania tropica* was found in 95. The disease was known to be prevalent in the up-river towns, Amara, Baghdad, Nasariyeh and Ahwaz, but Basra also provided many, for of a series of 125 cases 46 were probably infected in Basra. Many trivial cases passed unnoticed, unless specially looked for. In one small unit 35 cases were found amongst men who had not reported sick.

The case of a sepoy is mentioned who came to hospital with large sores on the wrists and forearms. There appeared eight days later 28 small papules on the back and flanks. In these the specific parasite was found. In two or three weeks the papules had mostly dried and healed, the original sores persisting for over two months. This case suggests blood infection from a primary sore leading to secondary sores. Several cases of Oriental sores commencing at the site of a wound or abrasion are referred to. In six cases nodules, partly intradermal and partly subcutaneous, appeared above the site of infection. On excision these were found to contain *L. tropica*. In no case did they develop into ulcers or sores resembling Oriental sore.

Several cases were noted in which the original sores were large and few in number, while at intervals of days or weeks numerous small, less active sores appeared about the body. As a rule the disease is not associated with any constitutional disturbance. In no case was involvement of the mucosae noted.

As regards treatment the authors state that there is no specific remedy. They found CO_2 snow followed by methylene blue ointment, strong solution of iodine, or zinc sulphate ointment, useful in some cases. In others ionization (zinc or mercury ions) has yielded good results, as also treatment with black wash alternating with calomel powder.

The cases usually seen can be placed in four categories :—

(*a*) Large open sores, $\frac{3}{4}$ to $1\frac{1}{2}$ in. in diameter, with hard, round, indurated and pigmented edges, with a tendency to healing in parts.

(*b*) Somewhat smaller open sores, with red oedematous and obviously infected tissue surrounding them.

(*c*) Subcutaneous unbroken nodules with involvement of the overlying skin and appearing as if about to break down.

(*d*) Small papules $\frac{1}{16}$ to $\frac{1}{8}$ in. in diameter.

The best method of discovering leishmania in these various types is discussed. The fine drawn out pipette is useful in types (*b*), (*c*) and (*d*). For sores of type (*a*) it is best to snip out a portion of the edge of the ulcer with fine curved scissors and to make smears with the piece of tissue. A sharp, curved scoop is most useful in sores of type (*a*) for obtaining material for making films. The scoop can be made from a straight Hagedorn needle of largest size by cutting off the point and grinding to make a small curved spatula, the edges of which are sharpened. The spatula is then bent at the end.

C. M. W.

Franco (Enrico Emilio). **Contribuzione alla conoscenza dell' anatomia patologica della Leishmaniosi cutaneo-mucosa od americana.**—*Arch. per le Sci. Med.* 1921. Vol. 44. pp. 246–267. With 11 plates.

This long paper describes the conclusions to which the author has come as to the histological changes which occur in the lesions of South American cutaneous leishmaniasis. Numerous ulcers which occurred in various parts of the body, including the mucosa of the nose of a case of Brazilian origin, were studied. The patient had died of cachexia resulting from the prolonged illness. The appearances seen in sections of each ulcer are described separately and the nature of the large cells, which include the parasites, is discussed. A series of plates illustrates the condition of the patient and the character of the tissues as seen in smears and sections.

C. M. W.

Yoosuf (A. K.). **Aleppo Boil; also called Delhi Boil, Kandahar Sore, Oriental Sore.**—*Boston Med. & Surg. Jl.* 1922. May 18. Vol. 186. No. 20. pp. 675–677.

The only interest of this paper lies in the revelation it provides of the slowness of the dissemination of human knowledge. It might have been written more than twenty years ago, for the etiology of Oriental sore is discussed as if the parasite *Leishmania tropica* did not exist. With the utmost complacency the author concludes that the disease is of a parasitic nature and quotes Virchow in support of this theory. German writers are said to have recently discovered an animal parasite belonging to the family "Leishman farunculosa," an organism which some think "similar to that of syphilis, sleeping sickness or continued fever." The author inclines to the view that a micrococcus is the cause of the disease.

The reviewer, whose business it is to read the literature on this and kindred subjects, can but offer a protest against the inclusion of such a paper in a well-known medical journal.

C. M. W.

i. Newman (R. E. L.). **Note on Three Cases of Infantile Kala-Azar.**—*Jl. Roy. Army Med. Corps.* 1922. May. Vol. 38. No. 5. pp. 379–381.

ii. Gastou (Paul). **Cinq cas de leishmaniose cutanée.**—*Rev. Méd. et Hyg. Trop.* 1922. Mar.–Apr. Vol. 14. No. 2. pp. 33–37.

iii. Right (L.). **Per la leishmaniosi in Sardegna.**—*Sperimentale.* 1922. Vol. 76. No. 1–3. pp. 87–98.

i. A record of three cases of kala azar in children in Malta.

ii. A record of five cases of Oriental sore, one from Morocco, one from Cilicia, and the others from Biskra.

iii. A record of a case of cutaneous leishmaniasis in Sardinia accompanied by a long dissertation on leishmaniasis in general.

C. M. W.

RELAPSING FEVER AND OTHER SPIROCHAETOSES.

GILL (C. A.). **Relapsing Fever in the Punjab. (A Preliminary Report.)**—*Indian Jl. Med. Res.* 1922. Apr. Vol. 9. No. 4. pp. 747–780. With 3 charts and 4 maps.

When the official summary of the facts and figures bearing on the incidence of malaria in the Punjab for the year 1920 was being prepared it became apparent that something unprecedented had occurred in connexion with the mortality returns under the head of fevers, which showed a phenomenal rise during May and June. It had been conclusively demonstrated that during this particular year the malaria was of a specially mild type, so that it was evident that the increased mortality of these two months was due to some other cause. In this report the author arrives at the conclusion that it was due to a widespread epidemic of relapsing fever, which was responsible for the death of at least 26,000 persons and the sickness of at least ten times this number.

By a series of careful arguments it is shown that this heavy mortality can be attributable to no other cause than relapsing fever, and that similar outbreaks had occurred in the years 1869, 1878, 1891 and 1906.

The author has something to say about the Indian vital statistics, which are usually regarded as so unreliable as to be valueless for scientific purposes. He admits the numerous fallacies they contain, but argues that if rightly considered they are capable of throwing considerable light on the incidence of many epidemic diseases. It is neglect of this fact which is responsible for the relative abandonment, more especially in recent years, of epidemiological research in India.

In this epidemiological study the author is not concerned with the cause of the outbreaks nor the factors which influence them, but with the figures and statistics which justify him in concluding that relapsing fever is a disease which must be regarded as widely endemic in the Punjab, and which at more or less regular intervals assumes an epidemic form. The report, which will prove of great interest to the epidemiologist, is illustrated with numerous maps, tables and charts.

C. M. Wenyon.

CRAGG (F. W.). **The Epidemiology of Relapsing Fever in India.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1922. Feb. 16. Vol. 15. No. 8. pp. 236–252. (Discussion, pp. 252–256.)

By a study of the vital statistics very similar to that undertaken by GILL for the Punjab (see above), the author has reached the similar conclusion that relapsing fever is endemic in the United Provinces in numerous foci, and that periodically it spreads from these in epidemic form. Seeking an explanation of these outbreaks, the author finds it in the bionomics of the louse. In the cold weather in India the louse is dependent upon the human body, which has a higher temperature than the surrounding air. With the advent of the hot weather the temperature and humidity of an ordinary Indian house becomes the optimum for this insect. When, therefore, the temperature of the air approximates to that of the body there is no retarding of the insect's metabolism when it is temporarily separated from its host.

On the other hand it becomes exceedingly active and lays eggs freely. As the temperature rises still more towards the end of April and early in May, the optimum is passed and the lice begin to die off. In the early part of the hot weather there is thus a period which is specially favourable to this insect. The seasonal incidence of relapsing fever is explained by the reaction of the insect host of the spirochaete to the varying climate. The occurrence of relapsing fever in epidemic form is to be accounted for by an alteration of the usually prevailing conditions. If for some reason the temperature does not rise rapidly in May and the humidity of the atmosphere also remains high, the optimum conditions for the louse are much prolonged, while the natural climatic delousing which normally occurs in May and continues through the hot weather is much curtailed. In consequence many more lice survive the hot weather, they multiply on the human body during the winter, and when the optimum period is reached in the succeeding year there is an enormous increase in the number of lice which bring about epidemics of relapsing fever. The arguments brought forward in favour of these views are illustrated by actual experiments conducted by the author and by figures from the statistics.

C. M. W.

HAROLD (C. H. H.). **Tick Fever in East Persia.** [Correspondence.]—*Jl. Roy. Army Med. Corps.* 1922. May. Vol. 38. No. 5. pp. 398–400.

In this letter the author refers to his previous paper (this *Bulletin*, Vol. 17, p. 372) on relapsing fever in Persia. He thinks that an erroneous impression has gained ground (see Manson's Tropical Diseases, MANSON-BAHR) that the disease in this country is of a particularly mild type. On the contrary it is, if anything, exceptionally severe, the short duration of the illness and the low mortality rate amongst the cases seen being due to early diagnosis and immediate treatment with salvarsan products.

As regards the vector, he is strongly of opinion that, though *Argas persicus* may occasionally serve, *Ornithodorus lahorensis* is the real vector. He brings forward evidence to show that though men came in contact with *Argas persicus* there was little evidence that they were actually bitten by this tick, but there was good reason to suspect *O. lahorensis*.

C. M. W.

VAN DEN BRANDEN & VAN HOOF. **Recherches sur la fièvre récurrente africaine.**—*Bull. Soc. Path. Exot.* 1922. Apr. 12. Vol. 15. No. 4. pp. 220–229.

The paper contains a description of investigations on relapsing fever in the Congo. Having been informed by RODHAIN that the flying-fox (*Eidolon helvon*) could not be infected with the organism of relapsing fever, the authors attempted to infect these animals by intravenous injections of blood and by the bites of known infected ticks (*Ornithodorus moubata*). In no case was an infection produced.

The existence of relapsing fever transmitted by *Ornithodorus moubata* in Central Belgian Congo is established, and it is evident that several endemic foci of the infection exist. The disease produced in man does not differ in any way from relapsing fever seen by them in German East

or other parts of Africa. It is pointed out that though kharsivan will usually arrest the disease, in some cases the typical course is run after a dose of 0·6 gm.

The question of the leucocytic formula of the disease is discussed. It has been maintained that during the attack there is an increase in mononuclear cells above the normal with a decrease below the normal during the intervals. The authors produce evidence to show that though this change may occur in some cases, in others it does not, while the leucocyte formula of the natives is naturally so irregular that the blood picture in relapsing fever in the Congo cannot be regarded as pathognomonic of the disease.

C. M. W.

Pino-Pou (R.). **La Fiebre Recurrente en general y particularmente en Venezuela.**—*Gac. Méd. de Caracas.* 1921. May 15, May 31 & June 15. Vol. 28. Nos. 9, 10 & 11. pp. 111–123, with 9 figs.; pp. 125–137, with 6 figs.; pp. 139–150, with 6 figs.

The discovery of cases of relapsing fever in Venezuela is made the text of a long dissertation on this well-known disease. The statement that the spirochaete differed morphologically and biologically from those of other countries evidently cannot be taken seriously. It was inoculable to rats, and the claim is made that on one occasion transmission was effected experimentally in rats with *Cimex rotundatus*. *Ornithodorus talaje* is suspected of being the vector.

C. M. W.

Oettinger (J.) & Halbreich (J.). **Ueber das Vorkommen einer ephemeren Roseola beim Rückfallfieber.** [The Occurrence of an Ephemeral Roseola in Relapsing Fever.]—*Münch. Med. Woch.* 1922. May 26. Vol. 69. No. 21. pp. 778–779.

In a number of cases of undoubted relapsing fever seen in Russia the authors have noted the occurrence of a rash which is ephemeral in nature, and appears, as a rule, shortly before the crisis of the first attack. The roseola may be uniformly distributed over the whole body or confined to limited areas of the skin, so that a careful examination may have to be made to discover it. Each small red spot, which is the form taken by the rash, lasts from not more than one to two hours. Sometimes the spots disappeared in a shorter time than this. The period during which the spots appear and disappear is about 24 hours. The rash was noticed in 15 per cent. of all the cases observed.

C. M. W.

Mayer (Arthur). **Spirochäten und Blutbild beim Rückfallfieber.** [Spirochaetes and the Blood Picture in Relapsing Fever.]—*Ztschr. f. Klin. Med.* 1922. Jan. 25. Vol. 90. Nos. 1–3. pp. 141–163. With 12 charts.

This is a long paper describing the condition of the blood in relapsing fever. As regards the spirochaetes, the normal course is for them to disappear from the blood shortly before the crisis of each relapse and to reappear just before a relapse. In some cases the spirochaetes reappear earlier than usual, with the result that the intervals between the febrile attacks are shortened; in others, however, though the spirochaetes reappear, the access of fever does not occur till after the

usual interval. Occasionally the spirochaetes may be present in the blood continuously though the temperature chart shows fever of a relapsing type with several periods of apyrexia; in such cases the prognosis is bad. In what the author calls a septic-bilious form of the disease the spirochaetes may be entirely absent from the blood or present only on a single day in small numbers. The symptoms associated with this condition are intense jaundice, haemorrhagic diarrhoea and coma. The tissues of fatal cases show the lesions due to a septicaemia, and isolated spirochaetes can be found in the liver. Attention is called to the slight rises in temperature which may occur between the relapses and during convalescence of normal cases. In such abortive attacks spirochaetes may or may not be present for a short time. In three cases spirochaetes were found 19 days and in one 22 days after the last attack of fever.

During convalescence the increase in the number of the red blood corpuscles, which have decreased during the attack, is retarded if spirochaetes persist in the blood. For the period of such persistence the Arneth index is deflected to the left. The leucocytosis is due to an increase in neutrophile cells, and, unlike that occurring in malarial attacks, persists, though it is less marked during the afebrile intervals. There is a definite increase in the number of large mononuclear cells, while that of the eosinophiles is decreased.

C. M. W.

Karwacki (L.) & Krakowska (Z.). [**O zachowaniu sie bialych cialek Krwi w goraczce powrotnej. (Les leucocytes dans la fièvre récurrente.)**]—*Lekarz wojskowy* (*Méd. Milit.*). 1921. No. 29. [Summarized in *Bull. Inst. Pasteur.* 1922. Mar. 15. Vol. 20. No. 5. pp. 200–201.]

The leucocyte formula of the blood in relapsing fever varies with the period of the disease. During the febrile stage there is a leucocytosis of 10,000 to 15,000. This is mainly due to an increase in the polymorphs. This persists for some days after the crisis and gradually disappears during the fifth to the ninth day. The proportion of lymphocytes increases after the crisis and may reach a percentage of 42, but in cases which will not relapse it gradually declines and the blood picture becomes normal. If the high percentage of lymphocytes persists, a relapse may be expected.

C. M. W.

Sangiorgi (Giuseppe). **Le spirochetosi dei muridi (Considerazioni critiche). Nota 1.**—*Pathologica.* 1922. May 1. Vol. 14. No. 323. pp. 253–256.

Since Carter described a small spirochaete (*S. minor*) from the blood of rats in India, a number of similar organisms have been discovered in rats and mice in different parts of the world. In this paper the author discusses these various forms and compares them with *S. morsus muris*, the causative organism of rat-bite fever. The details of the discussion lose much of their value from the fact that the author has overlooked a letter written by the reviewer (Wenyon, *Lancet*, 1906, Vol. 2, p. 954), which states that *S. laverani* Breinl and Kinghorn is identical with *S. muris* Wenyon. The latter was studied by the reviewer in mice in Paris, and it was in one of the reviewer's inoculated animals that Breinl and Kinghorn saw the organism which they named *S. laverani*.

The reviewer also examined the spirochaete seen shortly before by Borrel in the tissue of mice at the Pasteur Institute, and found it was identical with the form studied by him there.

Though the organism named *S. laverani* was from the same material as that named *S. muris*, the author of the paper under review regards them as different species. It is evidently quite incorrect to group together as a single species (*S. minor*) the short forms of Carter and Wenyon and the long form, *S. crucidurae*, of Léger, and as another species (*S. murinum*, a new name), *S. laverani*, *S. morsus muris* and other forms. The reviewer has examined *S. morsus muris*, and it, at any rate, is identical with *S. laverani*, *S. muris* and the short spirochaete of Borrel.

C. M. W.

Kasai (Katsuya). [**On the Differential Diagnosis of** *Spirochaeta morsus muris* **and** *S. muris*.]—*Chuwo Juikwai Zasshi* (*Jl. Central Vet. Soc.*). 1921. July. Vol. 34. No. 7. [Summarized in *Japan Med. World*. Tokyo. 1921. Dec. 15. Vol. 1. No. 8. p. 16.]

By inoculation experiments on rats, mice and guinea-pigs, and serological tests involving Pfeiffer's reaction and the protective properties of immune sera, the author has established the fact that the small spirochaete obtained from cases of rat-bite fever and the slightly larger form occurring naturally in rats and mice are identical.

C. M. W.

Gupta (Biraj Mohan). **Short Notes on a Case of Rat-Bite Fever in Shillong.**—*Indian Med. Gaz.* 1922. Apr. Vol. 57. No. 4. p. 139.

The paper records a case of rat-bite fever in a Hindu lady who was bitten on the forehead by a rat. Though the wound had healed, on the ninth day its site became oedematous and painful, and there was a rise in the temperature, which oscillated between 101° and 102·8° for three days. The temperature fell and remained normal for four days, when there was a second attack, which lasted six days. During this attack there was more reaction at the site of the bite and the glands on both sides of the neck became swollen. Blood was inoculated into two mice, one of which was killed six days later. In the heart blood *Spirochaeta morsus muris* was discovered and the diagnosis of rat-bite fever established.

C. M. W.

Vincent (H.). **Sur la nature de la bronchite sanglante. (Fuso-spirochétose bronchique.)**—*C.R. Soc. Biol.* 1922. May 13. Vol. 86. No. 17. pp. 1002–1004.

This paper is of interest, as it is from the pen of the discoverer of the condition known as Vincent's angina, which is associated with the presence of large numbers of spirochaetes and fusiform bacilli in the throat. The author reviews the various records which have been published of the presence of spirochaetes and fusiform bacilli in expectorations from the lungs. He believes, as many of the observers quoted also do, that the lung condition in spirochaetal bronchitis is due to invasion of the bronchi by the same organisms which occur in the pharyngeal condition. *Spirochaeta bronchialis* is identical with *Spirochaeta vincenti*.

C. M. W.

i. Baur (J.) & Codvelle. **Note sur un cas de bronchite sanglante à fuso-spirochêtes de Vincent.**—*C.R. Soc. Biol.* 1922. Mar. 25. Vol. 86. No. 12. p. 665.

ii. Deckerich (A.) & Ferry (G.). **A propos d'un cas de bronchite sanglante de Castellani.**—*Ibid.* May 20. No. 18. pp. 1103–1104.

iii. China Medical Journal. 1922. Jan. Vol. 36. No. 1. pp. 67–69. —**Department of Parasitology. Broncho-spirochaetosis in China. Abstract of Symposium.**

i. In the blood-stained expectoration of a case of muco-purulent bronchitis the author discovered polymorphic spirochaetes, fusiform bacilli and various other bacteria. He considers it impossible to differentiate the spirochaetes from those seen in Vincent's angina.

ii. A case of bronchitis with blood-stained sputum in which spirochaetes and fusiform bacilli were found.

iii. A description of some cases of broncho-spirochaetosis in China. The significant remark is made that the disease may be complicated by other conditions and frequently by tuberculosis. [Would it not be more correct to have stated that tuberculosis and other conditions of the lung may lead to invasion by the spirochaete?]

C. M. W.

Onorato (Raffaele). **Le spirochetosi broncopolmonari.**—*Arch. Ital. Sci. Med. Colon.* Tripoli. 1920. July–Aug.–Sept. Vol. 1. Nos. 7–8–9. pp. 301–303.

Rincones (P. Gonzalez). **Un caso de Espiroquetosis de Castellani simulando la tuberculosis pulmonar.**—*Gac. Med. de Caracas.* 1921. Dec. 15. Vol. 28. No. 23. pp. 365–366.

Monteiro (José Nascimento de Santana). **Um caso de febre recorrente Indiana.**—*Bol. Ger. Med. e Farmacia.* Bastora. 1921. Mar. & Apr. Ser. 7. Nos. 3–4. pp. 81–83.

INFECTIOUS JAUNDICE.

PARMANAND (M. J.). **The Presence of Infectious Jaundice in Bombay.** —*Indian Med. Gaz.* 1922. Feb. Vol. 57. No. 2. pp. 54–57. With 1 text fig. and 2 charts.

Seven cases of fever associated with jaundice came under the author's notice. One of these at least was of a severe type and clinically left no doubt as to the nature of the illness being Weil's disease. In the deposit from the centrifuged urine of two of the cases spirochaetes were discovered. It is concluded that they were the cause of the disease, but no precautions appear to have been taken to prevent contamination of the urine; nor has the possibility of the occurrence of saprophytic spirochaetes, which not infrequently occur in urine not drawn off by catheter, been considered.

C. M. Wenyon.

WADSWORTH (Augustus), LANGWORTHY (H. Virginia), STEWART (F. Constance), MOORE (Anna C.) & COLEMAN (Marion B.).— **Infectious Jaundice occurring in New York State. Preliminary Report of an Investigation, with Report of a Case of Accidental Infection of the Human Subject with** *Leptospira icterohaemorrhagiae* **from the Rat.**— *Jl. Amer. Med. Assoc.* 1922. Apr. 15. Vol. 78. No. 15. pp. 1120–1121.

During the summer and autumn of 1921 there occurred in New York State about 300 cases of an infectious or epidemic type of jaundice. An investigation of a large number of these did not produce any evidence of their being cases of Weil's disease.

During an investigation of a strain of *Leptospira icterohaemorrhagiae* obtained from rats, one of the laboratory workers became infected and developed a typical attack of Weil's disease. The case was thoroughly investigated and left no doubt as to the diagnosis. The only suggested path of infection is that of a needle prick, which the victim had accidentally inflicted upon herself. This appears to be the first case of unintentional laboratory infection of a human being.

C. M. W.

BEGER (H.). **Beobachtungen bei einer Laboratoriumsinfektion mit "Siebentagefieber."** [A Laboratory Infection with Seven-Day Fever.]— *Arb. a. d. Reichsgsndhtsamt.* 1922. Mar. Vol. 53, No. 1. pp. 1–6.

A laboratory worker in Germany became ill with a febrile disease proved to be due to a leptospira which was cultivated from the blood. The culture procedure, which has proved useful for the diagnosis of human cases and infections of experimental animals, is to introduce 3 cc. of blood into test tubes containing sterilized tap water and to incubate at 25° C. In about four days leptospira will be sufficiently numerous to recognize. The laboratory infection was due either to *L. icterohaemorrhagiae* or *L. hebdomadis*, which were then in the laboratory. By inoculation experiments and serological tests it was demonstrated that it was due to the latter organism. Though the leptospira of seven-day fever is not so nearly related to that of Weil's disease as are the various relapsing fever spirochaetes to one another, the author still regards them as races of one species.

C. M. W.

Mendelson (Ralph W.). *Pseudo-Leptospira icterohaemorrhagiae.*—*Jl. Trop. Med. & Hyg.* 1922. May 15. Vol. 25. No. 10. pp. 125–126. With 2 text figs

The author records the occurrence of leptospira in 8 of 1,483 rats examined in Siam. As no case of Weil's disease in man is known in this country, it is concluded that the rat organism is distinct from the human one and the name *Pseudo-leptospira icterhaem. rhagiae* is proposed. [This is undoubtedly incorrect, for even if the organism is a distinct species it must be included in the same genus.]

Attempts at cultivating the organism failed entirely. In view of the fact that it is easy to obtain cultures if the right technique is employed, it would appear that the description of the apparatus used by him, which he describes as quite satisfactory though failing to give a culture, is somewhat superfluous.

C. M. W.

i. Carrieu (M. L. & Sollier (N. **Présence, à Montpelier, de Rats parasités par** *Spirochaeta icterohemorragiae.*—*C.R. Soc. Biol.* 1922. May 13. Vol. 86. No. 17. pp. 991–993.

ii. da Silva (E. Pereira). **Sur la présence du** *Leptospira icterohaemorrhagiae* **chez les rats d'égout à Lisbonne.**—*Ibid.* pp. 1043–1044.

iii. Kasai (Katsuya). **On** *Spirochaeta icterohaemorrhagiae* **Inada which has been found in the Mouse.**—*Chuo Jishinai Zasshi* (*Jl. Central Vet. Soc.*). 1921. July. Vol. 34. No. 7. [Summarized in *Japan Med. World.* Tokyo. 1921. Dec. 15. Vol. 1. No. 8. p. 16.]

i. A record of the natural occurrence of *Leptospira icterohaemorrhagiae* in rats.

ii. The title of the note sufficiently indicates its contents.

iii. Having discovered an organism resembling that causing Weil's disease in a mouse, its identity with *Leptospira icterohaemorrhagiae* was established by inoculation experiments in guinea-pigs.

C. M. W.

YELLOW FEVER.

NOGUCHI (Hideyo). **Researches on Yellow Fever. Comparative Aetiological, Pathological, and Epidemiological Considerations; Prevention and Treatment.** — *Lancet.* 1922. June 17. pp. 1185–1190. With 3 plates.

This is an interesting and important paper which reviews much of the work done by the author and others on yellow fever. Of special significance are the remarks made about the diagnosis of the disease and the difficulty of distinguishing it from certain severe forms of Weil's disease.

After a historical summary the investigations which led to the isolation of *Leptospira icteroides* in Guayaquil are described, as well as the confirmatory work of the author and KLIGLER in Mérida (Yucatan) and Northern Peru. These results were repeated by GASTIABURU, PEREZ-GROVAS, LE BLANC and IGLESIAS in other localities. The author himself had succeeded in transmitting *Leptospira icteroides* from guinea-pig to guinea-pig by *Stegomyia fasciata*. This experiment has been repeated by IGLESIAS, who succeeded in transmitting the organism once 23 days and once 31 days after the mosquitoes had fed on infected blood.

The author considers the failure of earlier investigators to transmit the disease to animals. He thinks that generally speaking no thorough investigations were carried out, though Wolferstan THOMAS (1909-10) undoubtedly gave the disease to chimpanzees and guinea-pigs, and SEIDELIN evidently passed it on in series from one guinea-pig to another without discovering the leptospira.

The important question of the relation of yellow fever to infectious jaundice is discussed. Morphologically the leptospira from these diseases are indistinguishable, as also are that of Japanese seven-day fever, and the forms that occur in stagnant and salt water which have been studied by Miss TILDEN in the United States. The pathogenic leptospira are, however, by no means identical, as can be proved by their immunological and pathological properties. *L. icteroides* is predominately *icteronephritic* with a marked tendency to produce fatty degeneration of the parenchymatous cells of the liver and kidney; the haemorrhage in mucous membranes is more pronounced in experimental infections with *L. icteroides* than those resulting from *L. icterohaemorrhagiae*. In the case of *L. hebdomadis* the tendency to produce jaundice is very slight and may be entirely absent. These differences in experimental animals are largely matters of degree and this is true of the diseases in human beings. Typical cases of yellow fever are not readily confused with infectious jaundice, but cases of the latter with "black vomit," jaundice, nephritis, nervous symptoms, relative brachycardia cannot be differentiated clinically from yellow fever of similar severity. In such cases of infectious jaundice the boxwood liver of yellow fever may be found at autopsy. Furthermore, the black vomit and boxwood liver may both be absent in yellow fever. The two diseases are essentially similar though caused by two distinct species of the genus *Leptospira*, just as syphilis, yaws and venereal disease of rabbits are three diseases caused by three morphologically indistinguishable species of the genus *Treponema*.

Fatty degeneration of the liver and kidneys, both in human beings and experimental animals, is a characteristic feature of infection

with *L. icteroides*. It is much less marked in the case of those produced by *L. icterohaemorrhagiae*. A series of photographs of the microscopical appearance of sections of the liver and kidneys in yellow fever, infectious jaundice, acute yellow atrophy and phosphorus poisoning illustrate the changes in these organs.

The passage of the virus of yellow fever through dogs in series results in a gradual loss of virulence. The fact that guinea-pigs, puppies and marmosets can be inoculated with *L. icteroides* does not in any way modify the present day conception of the epidemiology of yellow fever. These animals can only be infected with difficulty under the most favourable conditions when relatively enormous quantities of virus are injected. In nature such massive doses are never injected. Under the circumstances these animals can hardly become reservoirs of yellow fever infection.

Reference is made to the results so far obtained in the use of leptospira vaccine as a prophylactic in yellow fever. Its application in Guayaquil has already been referred to [this *Bulletin*, Vol. 18, p. 249]. About 10,000 non-immunes were injected and of those which received two doses of 2 cc. of vaccine none contracted the disease, while a few of those who received a single injection became infected later. The comparison of these figures with those which were obtained amongst the unprotected was so striking that the protective value of the vaccine seems conclusively proved. It also appeared that protection was not manifest till 10 or 15 days had elapsed after the the last injection. A striking instance is quoted from Peru. Fifty non-immune soldiers were stationed in villages where yellow fever was at its height. Of these 25 were vaccinated. Of the unvaccinated, 20 contracted the disease, but none of the 25 vaccinated came down. Two other cases are mentioned in which 200 and 600 vaccinated soldiers stationed in yellow fever areas mixed intimately with the population without a single one of them contracting the disease. In British Honduras yellow fever broke out in St. John's College where nine cases occurred amongst 146 students. The entire college population was vaccinated; seven more cases occurred within 14 days, after which the outbreak ceased.

As regards the curative properties of the immune horse serum the author has record of 187 cases treated. Of 107 cases treated before or on the third day of the disease only 14 have died. On the other hand, the mortality among those treated after the fourth day has been nearly as high as in the case of those which have had no serum treatment. Early serum treatment appears to have reduced the mortality from 52 to 13 per cent. The beneficial effect of the serum is seen not only in the lowering of the death-rate, but in the rapid alleviation of both subjective and objective symptoms.

C. M. Wenyon.

Hoffmann (W. H.). **Ueber die Organveränderungen bei der experimentellen Infektion mit** *Leptospira icteroides*. [Histological Changes in Experimental Infection with *Leptospira icteroides*. – *Arch. f. Schiffs- u. Trop.-Hyg.* 1922. Vol. 26. No. 3. pp. 65–68.

From a study of the histological changes which occur in guinea-pigs infected with *Leptospira icterohaemorrhagiae* the author is struck by their resemblance to the changes which occur in the human tissues in Weil's disease, and their dissimilarity from those found in yellow

fever in man. As NOGUCHI's organism, *Leptospira icteroides*, produces in guinea-pigs changes like those of Weil's disease, he feels that the last word has not yet been said about the etiology of yellow fever.

C. M. W.

HOFFMANN (W. H.). **Los cambios histológicos en las infecciones experimentales con** *Leptospira icteroides* **y** *Leptospira icterohaemorrhágiae.* [The Histological Changes in Experimental Infection with *Leptospira icteroides* and *L. icterohaemorrhagiae*.]—Reprinted from *San. y Benefic. Bol. Ofic.* 1921. Nov. Vol. 26. No. 5. pp. 301–304.

The author examined in detail 300 guinea-pigs which he had infected with *L. icteroides* obtained from a yellow fever patient in Merida. He also made cultivations of *L. icterohaemorrhagiae* obtained from rats in Havana and transmitted this through several generations of guinea-pigs.

The clinical symptoms produced and the pathological findings, both naked-eye and microscopical, which are described in detail, were identical in each case, but were not those recognized as occurring in yellow fever; they corresponded completely with what is met with in human cases of Weil's disease.

The paper describes fully the changes produced in the blood, liver, spleen, lymphatic glands, kidneys, suprarenals, testicles, uterus, ovaries, tubes, bladder, stomach, intestines, pancreas, lungs and muscles.

There is no need to detail here the various findings in these tissues and organs, but the main points on which the author lays stress are the following:—In no instance was blood present in the stomach; the blood changes were essentially different from what is found in yellow fever patients; the tissues of the infected animals showed such alterations as correspond with a haemorrhagic septicaemia, for example, the marked hyaline degeneration of voluntary muscle and myocardium, the periodic leucocytoses, rapid and severe destruction of erythrocytes, phagocytosis of them in the spleen and lymphatic glands, conditions not mentioned as occurring in yellow fever patients. Also the liver in no instance showed the condition common in this disease; to the naked-eye it appeared congested and somewhat bile-stained, while, microscopically, the structure was well maintained and the cell-nuclei stained well; there was a slight degree of cloudy degeneration and some droplets of fat were seen also with Sudan staining; there were small haemorrhages between the cells, and usually an infiltration of lymphocytes along the interacinar vessels.

The author does not give a summary of his paper, but the main points on which he appears to insist are:—(1) That the only means of distinguishing between *L. icteroides* and *L. icterohaemorrhagiae* are by immunological reactions, and that these are not absolutely distinctive. (2) That the conditions produced by infection of guinea-pigs with these organisms proved, both macroscopically and microscopically, to be indistinguishable the one from the other. (3) That the changes set up are those found in human cases of infectious jaundice (Weil's disease). (4) That in no instance were the findings such as those which are regarded as typical of yellow fever in man. (5) That he, together with others (including GUITERAS, who is specially named), is therefore sceptical as to the etiological significance of *Leptospira icteroides* in yellow fever.

[A large number of animals were inoculated and careful, extensive and detailed histological examination was made of a considerable proportion of them, and the results were submitted to a meeting at which medical men well acquainted with yellow fever were present. If, therefore, these facts are confirmed, we may look for further communications on the question with expectant interest.]

H. Harold Scott.

Muñoz Ochoa (Miguel). **Tratamiento y Profilixia de la Fiebre Amarilla en Guatemala.** [The Treatment and Prophylaxis of Yellow Fever in Guatemala.]—Guatemala. 1921. Aug. 47 pp. With 3 text figs.

This thesis is divided into three parts, the first dealing with the pathology, the second with the treatment, and the third with the prophylaxis of yellow fever.

The first part begins with a brief history of the discovery of the *Leptospira icteroides*. The report of a case follows with a description in detail of the results of inoculation of guinea-pigs with the blood of the patient and with cultures of the organism on semi-solid medium (Ringer's solution, human serum and agar). Accounts are given of the autopsies of these animals and of others inoculated from them. In the latter the organism was found in greater numbers than in the former. The lesions produced were the same as those set up by *L. icterohaemorrhagiae* [as was remarked by Hoffmann in Cuba], but it was found that animals which had been infected with *L. icteroides* were immune to further inoculation with the same, but could be infected, sometimes severely and fatally, with *L. icterohaemorrhagiae*. It would seem, therefore, that the organisms, though related, are not identical. The former appeared to produce icterus and nephritis, the latter haemorrhages and nephritis in experimental animals.

The serum of recovered cases proved to possess both preventive and curative properties. Positive results were obtained by cultivation in three out of eleven cases.

A brief account of the symptoms and diagnosis is also contained in this section.

The second part, on the treatment of the disease, is very interesting. Polyvalent serum administered during the incubation period was found to abort the disease; if given in the early stages the fatal issue was averted; even in the later stages of jaundice and nephritis a distinctly beneficial effect was noticed. The serum is prepared by injecting horses with increasing doses (20 rising to 200 cc.) of living cultures of the leptospira. In 65 days a total of 2½ litres was injected. It is administered either subcutaneously or intramuscularly (more for prophylactic purposes), or intravenously (for actual cases). Two cc. is used for prophylaxis and 20 to 50 cc. for treatment according to the severity and stage of the disease.

Good results were reported from its use in El Salvador. Of four inoculated on the second day of illness all recovered; out of 12 on the third day there were nine recoveries; 13 out of 21 inoculated on the fourth day, and 15 out of 25 on the fifth day recovered. Amongst 37 injected within the first four days of disease there were 11 deaths.

Though salvarsan and neosalvarsan were found to kill the leptospira *in vitro*, neither had curative or preventive effects in man.

Part three, prophylaxis, is divided into what the author designates as the "permanent campaign" in normal (inter-epidemic) times

and the "epidemic campaign" when the disease is actually in being. In this section an account is given of the stegomyia and its habits. Among the special points requiring attention in inter-epidemic periods are continuous water supply, the extermination of mosquitoes, control of immigration, and the organization of a body of inspectors. Propaganda by leaflets and instruction in schools are also mentioned. Under the second—epidemic campaign—the following points are dealt with:—Notification of all cases, suspicious as well as certain; isolation of the patient and enforcement of the use of a mosquito net in the early stages of the illness; destruction of all mosquitoes in the infected house, and enquiry into the patient's recent movements, in order to trace the route by which the disease was introduced. Next, the posting up of notices warning the public as to the way in which yellow fever is contracted, and how they may avoid infection by abstaining from visiting the sick, by not going out at night into the infected quarters. He recommends the appointment of a disinfecting squad for dealing with all the houses in the district, if possible, and placing those living there in a limited quarantine.

Lastly, the advantages of vaccination by killed cultures of the organism are pointed out. The vaccine is sent out in vials of 20 cc. (sufficient for ten persons). Figures are given in support of its efficacy. Thus, at El Salvador in 1919-20, amongst 3,469 inoculated only 10 contracted the disease, and of these 5 terminated fatally (1·4 per 1,000). In Guatemala in 1918 vaccine was not used and over 300 deaths occurred; two years later 4,000 persons were inoculated and there were only 20 deaths.

When injected subcutaneously there was local inflammation and a slight rise of temperature, but no adverse effects followed when it was injected intramuscularly and distributed by gentle massage.

H. Harold Scott.

VERGNE (Eduardo). **A propósito de la fiebre amarilla y de los estragos producidos en las tropas de guarnición en el Departamento de Lambayeque.** [The Ravages of Yellow Fever among the Garrison in Lambayeque.]—*Cronica Med.* Lima. 1921. Oct. Vol. 38. No. 700. pp. 309–321.

On January 29, 1921, three officers and 49 soldiers arrived at Ferreñafe. They had no nets or any protection against mosquitoes. On the fourth day after their arrival two men fell ill with yellow fever and four more on the following day. Between that date (Feb. 2nd) and the 8th nine more were attacked, and by the 22nd there were 25 patients in hospital with this disease, that is half of the newly arrived garrison. There were eight deaths.

A cordon was instituted to prevent anyone leaving the locality without a signed pass; others were detailed as inspectors to examine houses for stegomyia and water receptacles for their larvae, and if during their inspection they came across any suspicious case this was reported at once to the doctor and steps were taken to deal with it.

The above facts are made the text for a brief discourse on yellow fever in general, its history, epidemiology, and symptomatology. The description is accurate, but does not contain anything not mentioned in the text-books.

H. Harold Scott.

Quiros (Manuel) **Demostración de la via que ha seguido la fiebre amarilla al invadir el norte del Perú.** [The Route taken by Yellow Fever in invading Northern Peru.]—*Cronica Med.* Lima. 1921. Dec. Vol. 38. No. 702. pp. 381–401.

The author deals first with the question as to whether yellow fever is endemic in Tumbez (where the first case occurred in the epidemic of October, 1918, to April, 1919), and concludes that it was introduced from Guayaquil. There had apparently been a small outbreak in 1893 following a recrudescence in Guayaquil the previous year.

The earlier cases of the 1918 outbreak were diagnosed as "Influenza," but the symptoms included marked jaundice, haemorrhages and black vomit. Some of the later cases were designated "uraemia," "septicaemic plague," "typho-malaria."

The first case was an itinerant vendor who was taken ill at Santa Rosa (he had come from Guayaquil, it appears) and died at Tumbez. The route of spread of the cases is given in detail.

H. Harold Scott.

Carter (H. R.) **Yellow Fever in Peru. Epidemic of 1919 and 1920.** —*Amer. Jl. Trop. Med.* Baltimore. 1922. Mar. Vol. 2. No. 2. pp. 87–106.

It was shown by the Rockefeller Foundation that Guayaquil was the key to the West Coast of South America as far as yellow fever was concerned. The present paper describes the campaign in the coast towns of N. Peru with a view to the elimination of the disease which was introduced from Guayaquil. By the adoption of the usual measures an entirely successful result was obtained in the northern department, the last cases of suspected yellow fever occurring in September, 1919. The work which is still in progress should free the entire Pacific coast of South America from yellow fever.

C. M. W.

Henric & Lamoureux. **Un cas de fièvre jaune à la Martinique.**— *Ann. de Méd. et de Pharm. Colon.* Paris. 1921. Apr.–May–June. Vol. 19. No. 2. pp. 179–181.

During June and July, 1919, there occurred in Martinique several cases of an acute febrile disease which produced great prostration and albuminuria. All the cases recovered in about five days. In January, 1921, there occurred a case which presented all the clinical features of yellow fever, and the authors of the paper had no hesitation in diagnosing this condition. The patient died, but no autopsy was performed.

C. M. W.

Spire. **Historique des différentes épidémies de fièvre jaune au Dahomey.** —*Ann. de Méd. et de Pharm. Colon.* Paris. 1921. July–Aug.–Sept. Vol. 19. No. 3. pp. 335–345.

Yellow fever has never been officially recorded as occurring in Dahomey previous to 1905, but a study of the official record convinces the author that prior to this date the disease was actually present, but was called bilious haemoglobinuric fever. He traces the various outbreaks which have occurred. There was an epidemic (13 cases) in the first half of 1905. It died down but reappeared early in 1906

(12 cases). In 1907 there was a single case, while from 1908–10, though the disease occurred in other parts of W. Africa, Dahomey was free. There were two cases in 1911 and eight in 1912. The last outbreak occurred in 1913 with six cases.

It is concluded that there are two foci of the disease in Togo, one at Lomé and the other at Anécho. In Dahomey there are three foci, at Agoué, Grand-Popo and Ouidah.

C. M. W.

Hoffmann (W. H.). **Das Gelbfieber in Westafrika.** — *Arch. f. Schiffs- u. Trop.-Hyg.* 1921. Vol. 25. No. 10. pp. 291–294.

The paper is a criticism of the conclusions arrived at by the commission which went to W. Africa under Noble to report on yellow fever, some details of which have been given by Guiteras in Havana. The statistical methods which amongst the mixed population of America serve to reveal past epidemics of yellow fever are not applicable to W. Africa. Guiteras has shown that when yellow fever is prevalent in any locality in America the mortality rate for white children rises considerably above that for other types. Because no such marked rise was noted in W. African figures it is concluded that no trace of yellow fever could be found. The writer of the article maintains that the two countries are not comparable, as in W. Africa the white children form but a very small percentage of all the children. He agrees that it is very probably as Guiteras maintains—that yellow fever in W. Africa has already ceased to exist.

C. M. W.

Seidelin (H.). **Notes sur la prophylaxie et le traitement de la fièvre jaune au Congo.**— *Ann. Soc. Belge de Méd. Trop.* Brussels. 1921. May. Vol. 1. No. 2. pp. 231–233.

A short account of the measures adopted to check the outbreak of yellow fever at Matadi in October, 1917. It is supposed that the epidemic was due to the introduction of infected mosquitoes by a ship, though there was no evidence that any cases of the disease had occurred on board.

C. M. W.

i. Lemaire (Neveu). **Les grandes endémo-épidémies intercoloniales.** [Yellow Fever.]—*Presse Méd.* 1922. May 3. Vol. 30. No. 35. pp. 721–727. With 2 figs. and 2 maps in text.

ii. Olpp. **Spezifische Therapie und Prophylaxe des Gelbfiebers.**—*Münch. Med. Woch.* 1922. Mar. 3. Vol. 69. No. 9. p. 311.

i. A general description of yellow fever and its distribution, with remarks on the possibility of its extension as a result of the Panama Canal.

ii. A note on the results which have been obtained by others with Noguchi's prophylactic vaccine of the yellow fever organism and the curative serum. These have already been noted in the *Bulletin*.

C. M. W.

Cavassa (Nicolás E.). **La fiebre amarilla en la provincia de Pacasmayo.** *Crónica Méd.* Lima. 1921. Dec. Vol. 38. No. 702. pp. 401–408.

Noguchi (Hideyo). **Profilaxis y seroterapia de la fiebre amarilla.**—*Repert de Med. y Cirug.* 1921. Dec. Vol. 13. No. 3. (No. 147.) pp. 118–134.

MALARIA.

Bulletin de la Société de Pathologie Exotique. 1922. Mar. 8. Vol. 15. No. 3. pp. 150–153.—**Rapport de la Commission du Paludisme. Commission désignée à la séance de novembre et composée de MM. Marchoux, président; Broquet, Brumpt, G. Martin, Roubaud, membres; Edmond Sergent et J. Rieux, rapporteurs.**

The weight which attaches to the names of these Commissioners justifies, or necessitates, a rather full summary of their findings, which may probably be fairly abstracted thus, and are reproduced without comment :—

Malaria is caused by a Plasmodium parasitizing the erythrocytes and not present in any other cell unless ingested by phagocytosis. Mature "gametes" remain permanently enclosed in erythrocytes deprived of their haemoglobin. These are not immortal; a certain number regenerate by parthenogenetic division into schizonts. The erythrocyte's haemoglobin is transformed by the parasite into melanin, which is broadcasted by the erythrocyte's disintegration during the parasite's sporulation. The pigment is absorbed by phagocytes and fixed in the connective tissue, thus producing the malarial tint and the "pseudosclerosis" of perivisceral or intravisceral connective tissue, with resultant enlargement of liver and spleen. Multiplication of parasites can be considerable enough to produce, especially in malignant tertian malaria, overcrowding of the fine capillaries and arrest therein of the infested erythrocytes. This arrest is followed by capillary or more extensive haemorrhage, which may leave definite lesions.

Relapses are due, according to Grassi & Schaudinn, to parthenogenesis of macrogametes; according to Ross, to sparse persistence of schizonts. In general, freedom from evidence of clinical infestation for 8–10 months means disinfestation. There persists a relative immunity particularly for the race of parasite concerned. Exceptionally, relapses, clinical and parasitic, may reappear after several years' apparent cure. Chronic malaria consists of poikilocytic, anaemic, cachexia with its essential concomitants (often without notable fever) in those subject to relapses or reinfections. Excessive formation of fibrous tissue in spleen and liver causes their enlargement. There is no evidence that these organic lesions are progressive. In repatriated malarial infections evidence of infestation nearly always ceases to be obtainable after 12 to 15 months' residence in France. Such cases may be permitted to return to the colonies if they have been free from all evidence of infestation for 18 months from any January, if their general condition be good, if they have no anaemia or splenomegaly, if their leucocytic count be normal; provided that they exercise rigorous precautions and have never had haemoglobinuria.

Clayton Lane.

McLay (Kenneth). **Malaria in Macedonia, 1915–1919. Part III. Haematological Investigations on Malaria in Macedonia.**—*Jl. Roy. Army Med. Corps.* 1922. Feb. Vol. 38. No. 2. pp. 93–105. With 1 plate and 3 charts in text.

Of 1,136 cases of malaria microscopically diagnosed as such either in the special wards of the Fifty Second General Hospital or before

admission, 562 never gave evidence of malaria while in hospital. Of 586 cases whose blood was examined on the day of admission, only 23 or 3·9 per cent. were positive. Of cases at some time proving positive 462 were infestations by *Plasmodium vivax*, 100 certainly or probably by *P. falciparum*, 9 were mixed infections by both forms, while in 33 the species was doubtful.

Comparing the effects of 60 gr. of quinine hydrochloride by mouth with the same weight of quinine bihydrochloride intramuscularly or subcutaneously, the number of cases being 60, 60 and 9 respectively, it was found that blood films became negative earlier with oral than with either of the other two routes of administration. This observation is compared with Captain T. S. Hele's findings that there is a more rapid excretion of quinine in the urine after oral administration on a healthy stomach than after intramuscular administration. In 55 per cent. of the intramuscular cases there was a rise of temperature to at least 100° F., with leucocytosis. A similar leucocytosis following injection of antipyrin is similarly attributed to local trauma. No evidence of fragility of erythrocytes was found in nine cases investigated. It was noted that, as usual, sporulation was not limited to the period of the rigor.

C. L.

Eugling (Max). **Ueber Malariabekämpfung: Beobachtungen und Untersuchungen aus dem albanischen Malaria-Gebiet.** [Anti-malaria Measures: Observations and Researches in Albania.]—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1921. Vol. 25. Beihefte 1. pp. 5–63.

The interest of war-time malaria in Albania will lie largely in its correlation with the conditions already described so fully for Macedonia [this *Bulletin*, Vol. 19, p. 277, etc.]. Yet this paper contains close observations of wider interest. Since from 160 to 180 per cent. of the normal strength was at one time down with malaria, cadres had on that account to be greatly increased. Indeed, it is calculated that in Albania 100,000 men contracted malaria. Of 10,411 positive examinations at the Alessio Field Laboratory, 8,163 or 78·4 per cent. were subtertian, 2,173 or 20·9 per cent. tertian, 18 or 0·16 per cent. quartan, while only 57 or 0·54 per cent. were diagnosed as of mixed or doubtful infestation.

The problem of prevention was attacked in four ways. (1) An antimosquito campaign. Since it is calculated that every anopheles female which survives the winter produces during the ensuing year seven and a half million descendants, the urgent necessity of destroying all hibernating mosquitoes is stressed, as being far easier and cheaper than is a summer campaign. In thatched houses hibernation took place actually within the hollow stalks of individual straws. Many certainly were vacant, but as many as 16 anopheles were found within a single straw. Roof beams and cobwebs were also favourite resting places. Means of destruction used were flaming by a benzine blow pipe, not of course in a thatched roof, tobacco and pyrethrum smoke, and spraying. It is significant that for the last case soapy were far more effective than soap-free solutions, and the blockade effected markedly the efficiency of this aspect of antimalarial work. Mosquitoes which survived the winter laid about 250 or 300 eggs about the beginning of June, and then died within a few hours or days; whereas females of the new brood, if maturing in August, laid 150 to 200 eggs; if in September or October, about 50 eggs, and did not thereafter

die. If mud were taken in winter from summer breeding pools and kept warm in water, freshly hatched larvae appeared in about three weeks, so that apparently eggs may survive winter. Although larvae lived for months under a layer of ice they were not observed surviving the winter in nature. Pupae are not mentioned. The summer temperature of shallow pools sufficed to kill larvae. Bats did not feed upon mosquitoes. Anopheline gluttony was such that the female filled herself with five times her own weight of blood, and as she preferred her meal in several courses, served generally by different persons, the chances of malarial dissemination were correspondingly increased. (2) Mechanical prevention of contact between man and mosquito is considered. (3) It is advised that quinine, for which neosalvarsan is no substitute, should be given prophylactically in 1 gm. doses on Wednesday and Saturday, and in a ½ gm. dose on Sunday. (4) Finally, separation of infected and non-infected, by the evacuation of one or the other, is dealt with.

C. L.

Marantonio (Roberto). **La tubercolosi e la malaria nella R. Marina durante il quinquennio 1915-1919.**—*Ann. di Med. Nav. e Colon.* 1922. Year 28. Vol. 1. No. 1–2. pp. 27–42.

Malaria was prevalent in the Italian Royal Navy during the war. It is dealt with under the headings of new cases and relapses, terms which, however, actually signify the first and subsequent entries on the official medical history sheet. Cases are also divided into the clinically light and the clinically grave. Microscopic diagnosis is not entertained. The percentage of the force requiring treatment between 1914 and 1918 increased nearly five-fold. Official prophylaxis, of which details are omitted, is nevertheless claimed to have achieved a veritable sanitary victory.

C. L.

McDonald (W. M.). **The Parasitology and Clinical Aspects of Malaria in Antigua.**—*Brit. Med. Jl.* 1922. Apr. 15. pp. 597–599.

Of 300 positive blood films, 61 per cent. showed *Plasmodium falciparum*, a third of them with crescents; 28 per cent. *P. malariae* and 11 per cent. *P. vivax*. The statement of Pratt-Johnson and Gilchrist [this *Bulletin*, Vol. 17, p. 302] that crescents are not found in the untreated or in acute cases of the disease, is, as was to be expected, traversed, the writer's crescent-containing cases being all untreated or at least such as had not been recently treated. Grave effects of malignant tertian infection are, in Antigua, apparently limited to children. The treatment recommended consists of an initial dose of calomel or salts, and 30–45 gr. of quinine daily, under which clinical cure is rapid; but subsequent persistence in the treatment is unheard of.

C. L.

Schüffner (W.) & Hylkema (B.). **Malaria in Belawan during the Construction of the Ocean-Harbour.**—*Mededel. Burgerlijk. Geneesk. Dienst. in Nederl.-Indië.* 1922. (Foreign Edition). Pt. 1. pp. 47–79. With 19 illustrations, 7 charts and 1 map.

This work does not fall from the high standard which one has learnt to associate with the Dutch East Indies. It will be a revelation to many to realize that the virgin mangrove forest does not there harbour malaria, but that as soon as clearance began conditions

were set up favourable to breeding of *Myzomyia ludlowi*, the main malarial definitive host in this region. There was obtained, moreover, as urged by Swellengrebel [this *Bulletin*, Vol. 17, p. 130], definite evidence of "breeding-place-deviation," the female ovipositing under quite different natural conditions, since these presumably suited her changed fancy or convenience. The percentage of mosquitoes infested was very high, 20 to 30 being recorded, and with this high degree of infection the extent of individual infestation was also high. One learns with regret that the auto inoculation experiments of Dr. and Mrs. Swellengrebel [this *Bulletin*, Vol. 16, p. 308] have run a serious course; it is suggested in the paper that this may have been due to the original receipt of a heavy infection. Some interesting work upon the effect on the mosquito of malarial infestation was recorded. Thus, while it was comparatively easy to find early infections among them, those with late infections were much rarer, presumably because the infestation induces a considerable mortality.

Systematic captures of mosquitoes were made, and it is significant that it was to the interior of mosquito nets, imperfectly repaired or improperly adjusted, but in any case supplied by the coolies themselves as a protection against the plague of Culicines, that the writers looked for the supply of many of their catches, so much so that they have a reasonable grievance against the "free" chinese coolie for smashing up the mosquitoes which his net, baited by his own body, had trapped. Bass's "bow-net" mosquito traps are described and illustrated, and were applied to stables with astonishingly effective results. It was found, so far as the experiments went, that buffaloes were more attractive to *M. ludlowi* than were cattle, so attractive indeed that "one single buffalo is able to divert the greater part of the ludlowi from the lodgings of 100 people." The antimalarial work was evidently carried out in a spirit of reasonableness, which was probably a considerable factor in its success.

C. L.

Swellengrebel (N. H.). **Fréquence saisonnière des Anophèles impaludés aux environs d'Amsterdam.**—*Bull. Soc. Path. Exot.* 1922. Feb. 8. Vol. 15. No. 2. pp. 116–119.

The author, in a series of observations embracing the whole of the year 1921, confirms the proposition that infected individuals of *Anopheles maculipennis* are seldom found in the houses of sufferers from malarial fever during the summer months, but are frequently found there during the winter months. For the year 1921 his tabular monthly record of oocyst-carrying Anopheles found in such houses shows the following figures:—

	Number of insects examined.	Percentage with infected oocysts.
January	251	0·4
February	221	1·3
March	218	1·4
April	124	0·8
May	236	0
June	472	0
July	601	0
August	104	0
September	467	1·3
October	787	6·2
November	637	5·0
December	975	6·1

The author does not say that *Anopheles maculipennis* does not get infected, or does not develop infection, during the summer; his contention is that, since cattle are 33 times more attractive than man to the insect, an infected insect going forth in the summer season to get rid of its eggs is not likely to return to a human habitation; in September, however, the production of eggs ceases, and the insects that have fed in houses stay where they have fed until the egg-laying season comes round again in the early summer following.

The author has further ascertained that there is no hibernation of sporozoites in the salivary glands. He believes, with Kortewег, from the facts that the majority of ripe oocysts are found in the October–December months and that the insects are particularly voracious at that time, that the infection is communicated to man during those months, but remains latent in him until spring. And he further concludes, from the fact of young oocysts reappearing in the months February–April, that the infection of the insects during those months is a fresh infection—thus amply confirming the observations of Sella at Fiumicino. Of course he understands that an abnormally low temperature retards the development of oocysts; but he contends that it is not the temperatures of the meteorologist that have to be considered, but the temperatures of the interior of houses. [The author's conclusions from his observations appear to be, in short, that the maintenance of malarial infection during the winter of the temperate zone is a sort of episodic hot-house modification of the natural process.]

Roubaud in his comments on the paper sees a confirmation of his theory of the protective influence of cattle in districts where Anopheles is abundant.

A. Alcock.

i. Ross (Ronald). **Malaria and the Mosquito.** [Correspondence.]—*Lancet.* 1922. Apr. 29. p. 868.
ii. ——. **The Work of Sir Patrick Manson.** [Correspondence.]—*Brit. Med. Jl.* 1922. Apr. 29. p. 698.

i. Ross objects to the statement, published in the *Lancet* of April 15, that Sir Patrick Manson "was the first to trace the connexion between the mosquito and the malaria parasite." The Editor of the *Lancet* explains and justifies the impugned statement by a quotation from Sir Patrick Manson's published writings. This quotation shows how, from observed facts in the behaviour of the malaria parasite when removed from the blood vessels, Sir Patrick Manson saw a clear analogy between the malaria parasite and the filaria parasite, and foresaw that the mosquito must be the liberating agent in the one case as it had been proved to be in the other. This is what the Editor of the *Lancet* meant to imply in the phrase "tracing of the connexion." [It may be added that Ross himself in a paper on "Malaria and Mosquitoes," published in *Nature* for March 29, 1900, pp. 522-527, has referred to Sir Patrick Manson's foresight in this matter in terms that bear the same implication as that drawn by the Editor of the *Lancet* from another source. Ross states in this paper that "it is to Manson's study of them" (*i.e.*, the gametocytes) "that we owe the solution of the malaria problem. Numerous observers had examined them before Manson's time, but all had failed at arriving at a correct idea as to their function."]

ii. Ross here objects to a statement published in the obituary notice of Sir Patrick MANSON (*Brit. Med. Jl.*, April 15, 1922), which suggests that MANSON was the first to establish "the transmission of an agent of disease by intermediary agents," and also to the suggestion that MANSON was the first to suspect the intermediation of mosquitoes in spreading the *Filaria bancrofti* parasite. [The first objection is, of course, valid, and the second also may be so. MANSON's real originality was (1) to have established the fact that an active and *aggressive bloodsucking arthropod* is actually the specific "nurse," or necessary intermediate host, of a specific organism pathogenetic to man; and (2) to have advanced a reasonable argument, namely the synchrony of "filarial periodicity" (a phenomenon first observed by himself) with the hours of mosquito activity for believing the mosquito to stand in the necessary relation of intermediate host to the filaria parasite.]

Ross also states here that MANSON "did not invent the mosquito theory of malaria." [This is true, if the word "theory" is used in a vague colloquial sense; but if it be used in its strict sense, to mean a reasoned proposition capable of proof along a definite line of investigation, then MANSON *was* the originator of the accepted mosquito theory of malaria, as, indeed, Ross himself long ago stated in *Nature* (March 29, 1900, p. 523). There Ross remarks of mosquito-malaria theories other than that of MANSON that they were little more than hypotheses based on arguments that would hardly attract the serious attention of a laboratory worker with a serious end in view, but that "On the other hand MANSON's theory was an *induction*—a chain of reasoning from which it was impossible to escape."]

A. A.

i CATANEI (A.). **Morphologie des *Plasmodium* dans un accès mortel de paludisme.**—*Bull. Soc. Path. Exot.* 1922. Feb. 8. Vol. 15. No. 2. pp. 104–107. With 3 plates.

ii. MARCHOUX (E.). **Multiplicité des races dans les trois formes de parasites du paludisme.**—*Ibid.* 1922. Feb. 8. Vol. 15. No. 2. pp. 108–109.

i. Working under the direction of SERGENT and PARROT, Catanei describes the morphology of Plasmodia seen in blood smears taken during life from a negro of Ouargla, Algerian Sahara, found unconscious in Maison-Canée, near Algiers. He was apparently of about 35 years of age, and was of unknown antecedents. On admission to hospital the spleen was not enlarged, the temperature was 35·9° C. (96·6° F.), the blood almost colourless, and 72 per cent. of the erythrocytes contained Plasmodia. Discrepancies in the figures render uncertain the actual percentages of the different forms of Plasmodium present, but it appears correct to state that about one third of 686 parasites examined and measured fell into one or other of the three generally recognized forms. Atypical forms numbered over a third of the whole, and comprised those bacilliform and amoeboid conditions which have been assigned to *Plasmodium praecox* and *P. vivax*, as well as those which have been described as *P. tenue*, *P. caucasicum* and *P. minutum*. Lastly, forms in process of division into from 2 to 25 Plasmodia, and others which could not be assigned to any hitherto recognized form, comprised rather less than a third of the whole. The conclusions are that ignorance of the man's antecedents renders impossible any conclusion as to the bearing of the case on the specific unity or otherwise of man's malarial parasites, but that in an untreated fatal case of

malaria all types of the parasite may present a polymorphism rendering exact diagnosis impossible.

ii. Marchoux contends that all three malarial parasites exhibit different races characterized by a different geographical distribution and a different morphology. Thus, in *Plasmodium falciparum* there are anatomical differences between the parasites contracted in West Africa, Italy and Macedonia. The number of gametocytes is, for instance, so he holds, few in the first—always abundant in the others. Their shape is ovoid in West Africa, crescentic in Italy and Macedonia. Again, the parasites of Madagascar differ slightly from those of West Africa, while the Indo-Chinese type is intermediate between that of Africa and Europe. Indeed, he maintains that parasites from Greece are distinguishable from those of Macedonia, but in none of these cases are the differences put into words.

Again, he is satisfied that *P. vivax* of France differs from that of North Africa, of Cape Verde and of the Amazon, and that *P. malariae* from North Africa is distinguishable from the compact Salonican form, while there is a distinct race on the Amazon. He explains the fact that Senegal negroes, immune to malaria in their own country succumb in Dahomey by this multiplicity of races, and draws analogies with the *Bacillus coli* group of bacteria.

C. L.

Paisseau (G.) & Loubrieu. **Paludisme autochtone à** *Plasmodium praecox.—Paris Méd.* 1922. Feb. 11. Vol. 12. No. 6. pp. 117–119.

A happy instance of that clear thinking which one likes to associate with France. It is first pointed out that of the 18 recently reported autochthonous cases of infection in France with *Plasmodium praecox* [*P. falciparum*] two have died, and that there is no justification for the suggestion that in temperate climates the infection becomes less grave. The influence of syphilis on autochthonous French infection is emphasized, 40 per cent. of these malarials being so infected, while six of the eight serious cases and one of the deaths occurred in syphilitics. Yet it is pointed out that it is perhaps the arsenobenzol used in the treatment of syphilis and not the syphilis itself which is to blame here, through the drug's action in activating malaria. The writers then pass on to the consideration of the question of the unity or otherwise of the plasmodial species, a question particularly canvassed in France, and put the case thus. It is a matter of common observation that in malarial cases *P. praecox* becomes during the first winter replaced by *P. vivax*. For this two possible explanations are offered; the first that the original infection is double and that the former species first suppresses the latter, but later dies out in its favour; the second that there is one species with different seasonal forms. Now it must be reasonably accepted that in France, where malaria is in any case so rare, the likelihood of an autochthonous case contracting a double infection is logically negligible, so that if, in these autochthonous cases of *P. praecox*, this form becomes replaced in the spring by *P. vivax*, the unity theory would be greatly strengthened. Although these cases have unfortunately not all been followed up, it is yet certain that, in the three of them which have been, *P. praecox* has persisted as such, having been found six times from February to June, during which period it should, were the unity theory correct, have been replaced by *P. vivax*.

C. L.

Rieux (J.). **Existe-t-il un "paludisme chronique" chez les paludéens définitivement rapatriés en France?**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1922. Feb. 2. Year 38. 3rd Ser. No. 3. pp. 162–167. (Discussion, pp. 167–172.)

Rieux returns to his previously expressed opinions that a malarial infestation reaching a non-malarial area in France in October will show typical symptoms with *Plasmodium præcox* in the blood and febrile attacks reappearing until January. Under quinine treatment tertian or quartan fever with the corresponding parasite will appear in the next February or March and will persist till June, or at the outside July, when the parasites will probably disappear. It is admitted that this disappearance may be delayed for 18 months. These cures are considered to fall into the following category:—Cures without sequelae, 20 per cent.; cures with definite malarial sequelae, such as anaemia or splenomegaly, 20 per cent.; cures with persistent troubles not certainly malarial, 60 per cent., of which gastro-intestinal affections comprise half and cholecystitis a quarter.

In the discussion which followed, the natural cure, in course of time, of all malarias was admitted, but the limitation of that time laid down by the lecturer was not generally allowed.

C. L.

Granjux. **Le paludisme chronique.** *Rec. Méd. et Hyg. Trop.* 1921. Vol. 13. No. 4. pp. 100–103.

La Société de Médecine Legale having received from one of its members a communication denying the existence of chronic malaria, and believing this statement to be opposed to general medical opinion, referred the matter to La Société de Médecine et d'Hygiène Tropicales, whose conclusion is that "chronic malaria exists and that, while the finding of the Plasmodium is one of the most important elements in diagnosis, the failure to do so is no evidence of the absence of malaria."

C. L.

Macdonald (Angus). **A Note on the Physical Estimate of Malaria Disability.**—*Jl. Roy. Army Med. Corps.* 1922. Feb. Vol. 38. No. 2. pp. 131–140.

A careful clinical and haematological examination of 172 men who had been for months—30 per cent. of them for more than 12 months—under treatment at a Command Depot, resulted in the recommendation that 155 were fit to return to their units: "It is contended that there are physical data ready to be obtained sufficient to establish in the case of the soldier his fitness for duty, and in the case of the civilian his fitness for work, apart from the academic question whether he may harbour a few stray parasites in his system." It is felt that the error on the safe side made by many with so little experience of malaria "has been inimical to army interests, to the service of the country at a time of crisis, and as well as to the men themselves, and resulted in the holding up in institutions, in command depots and light duty in their units, of men long fit for duty."

C. L.

Fry (A. B.) **The Role of Cattle in the Epidemiology of Malaria.**—*Indian Med. Gaz.* 1922. Jan. Vol. 57. No. 1. pp. 1–2.

Contrasting the sporozoit rate of about 30 per cent. reported at Wilberforce by Ross & Annett, and that of 25 per cent. at Aro, and of 50 per cent. at Loko Meji, reported by the Royal Society's Commission to Lagos, with the Bengal percentage of 0·2 based on the dissection of many hundreds of mosquitoes, Fry draws attention to the facts and conclusions which he recorded in 1914 in the Second Report on Malaria in Bengal, to the effect that it is difficult to find Anopheles in cookrooms or sleeping apartments of houses in Bengal, whereas in cowsheds they swarm. He refers to Ross's formula for the epidemiology of malaria, namely $b^2 s a i (1-m^n) m p$, where "*a*" is the rate of Anophelines per person, "*b*" the proportion which succeed in biting, "*s*" the proportion becoming infective, "*i*" the proportion of gamete carriers, "*n*" the malaria rate, and "*p*" the population, and points out that the biting factor is given a value far higher than is any other, and that the presence of cattle must certainly influence this factor; Schüffner having indeed found that certain Anopheline species definitely prefer bullock to man.

C. L.

Giuseffi (M.). **Bonifica umana e disinfestione idrica nel risanamento antimalarico.**—*Policlinico.* Sez. Prat. 1922. Apr. 24. Vol. 29. No. 17. pp. 549–550.

Following an antilarval campaign in 1919 (this *Bulletin*, Vol. 19, p. 284), the persistent drought, better feeding, an increase in domestic animals and sedulous administration of quinine, amounting in the mean to 69 gm. per head annually, the numbers of malarial cases microscopically diagnosed were reduced in the experimental area from 200 in 1918 to 98 in 1919, 86 in 1920 and 16 in 1921. The enthusiastic local schoolmaster fitted out his pupils, boys and girls, with butterfly nets. They relieved the stables of 450 Anopheles, of which three proved infected, but the antagonism of certain persons to this official, an antagonism which seems to have checked his contemplated campaign, is perhaps evidence that the boys, at least, did not limit their depredations to mosquitoes.

C. L.

Sainton (P.), Richet (Ch.) fils & Schulmann (E.). **Etat clinique et pathogénique de certains oedèmes palustres.—L'oedème palustre inflammatoire.**—*Ann. de Méd.* 1922. Feb. Vol. 11. No. 2. pp. 128–142. With 3 text figs.

Eliminating instances in which there is any evidence of a cardiac or renal causation, the writers draw attention to sudden oedemas and effusions into serous sacs, which may add at least as much as 5 kilos to the body weight. Such a condition affecting the glottis may be rapidly fatal. These effusions occur in subjects proved by microscopic examination of the blood or of an effusion to be malarial, and they clear up rapidly under quinine. Intravenous administration of the drug is advised under these circumstances, advice with which few will probably disagree. Yet the finding of the vein will perhaps not be such an easy matter.

C. L.

Tait (John). **"Marrow Pains" in Malaria and in Certain Other Acute Fevers.**—*Canadian Med. Assoc. Jl.* 1922. Mar. Vol. 12. No. 3. pp. 134–136.

This is "an attempt with limited pathological knowledge and restricted clinical experience to handle a clinical problem from a point of view originally suggested by experimental laboratory findings." The experimental findings are these. If Indian ink, suspended in saline, be injected into a rabbit's vein, there will be within an hour a complete disappearance of the fine black granules from the circulation. These are found ingested in endothelial cells lining the capillaries or sinusoids of the liver, spleen and bone marrow, and to a certain extent plugging mechanically the capillaries of the lung and kidney. It is suggested that the malarial pigment, similarly collected by the endothelial cells of the red marrow, produces the symmetrically distributed pains occurring fairly severely during a malarial paroxysm. The manner in which millions of particles are thus removed from the circulation by endothelial cells serves also to throw light on the difficulty in recovering from the blood organisms which are being transported by it in enormous numbers in septicaemia and in typhoid.

C. L.

Pennato (P.). **Sulla malaria congenita.**—*Riv. Crit. di Clin. Med.* 1921. Mar. 15. Vol. 22. No. 8. pp. 85–88. With 1 text fig.

The writer, investigating the problem as to why malaria sometimes is and sometimes is not transmitted to the offspring of infected mothers, suggests that it is upon the indemnity of the placenta that the fate of the foetus depends. The protective action of the placenta has been shown in respect to other poisons, as in a work by Ugo Soli reporting the protection of the foetus from acute mercury poisoning which was fatal to the mother. This protective action might fail from various causes, *e.g.*, the intensity and duration of the infection. It is to be remembered that the placental transmission of syphilis does not take place if the infection is contracted by the mother in the last two months of pregnancy. The writer recalls a previously published note on a necropsy of a pregnant malaric aged 40 and the five months' foetus. The florid viscera of the latter contrasted markedly with the great anaemia of the maternal organs. No sign of malaria was found in the foetus. Our knowledge of the functions of the placenta is not yet sufficient to warrant any dogmatic conclusions.

[The protective action of the placenta, from both maternal and foetal points of view, is strikingly illustrated by Clark [this *Bulletin*, Vol. 7, p. 15]. It appears on the maternal side to be an optimum habitat for segmenting forms of *P. falciparum*, so that by its expulsion the mother is rid of numbers of them, while at the same time it rarely permits their passage to the foetus and then possibly only after traumatism:—C. L.]

J. Rosslyn Earp.

Johnson (R. E. Ingram). **Dengue *v.* Malaria.**—*Jl. Trop. Med. & Hyg.* 1922. May 1. Vol. 25. No. 9. pp. 111–112.

There are here detailed a number of cases in which an attack of dengue has been followed, either by the cure of an existing malaria, or by failure on the part of the person concerned to become infected

under conditions in which there is every reason to believe that the Plasmodium has been transmitted. The writer has accordingly become convinced that the sufferer from dengue has become immune from malaria, a point on which there must be available a mass of evidence.

C. L.

GERSTMANN (Josef). **Ueber die Einwirkung der Malaria tertiana auf die progressive Paralyse. II. Mitteilung.** [The Effect of Tertian Malaria on General Paralysis.]—*Ztschr. f. d. Gesamte Neurologie u. Psychiatrie.* 1922. Vol. 74. No. 1–3. pp. 242–258.

One hundred and sixteen cases of general paralysis were treated by induction of malaria through hypodermic injections of blood containing tertian parasites [*P. vivax*] [this *Bulletin*, Vol. 19, p. 298]. Of these, 38 were unimproved, the illness remaining stationary in 19, dementia becoming complete in 7, death occurring in 12. Of the 78 remaining cases 42 recovered completely, that is to say have returned to their ordinary avocations for a period varying between a few months and two and a half years; while in 36 improvement, not amounting to complete recovery, ensued. Individual prognosis under this treatment is considered with diffidence.

C. L.

KOGERER (Heinrich). **Ueber die Probe mit Natrium nucleinicum bei der Malariabehandlung der Paralytiker.** [The Nucleinate of Soda Test in the Malarial Treatment of Paralytics.]—*Wien Klin. Woch.* 1922. Apr. 13. Vol. 35. No. 15. p. 342.

Mainly in the cases of deliberate malarial inoculations used in the treatment of the paralytic an injection of 0·5 gm. of nucleinate of soda was tried. The effects were believed to be so satisfactory in the 25 cases in which it was used that it has now become the standard line of treatment in the clinic. It is admitted that these inoculation cases have been of exceptionally mild type.

C. L.

CHAUFFARD (A.), HUBER (J.) & CLÉMENT (R.). **Paludisme chronique compliqué d'addisonisme, d'atrophie papillaire unilatérale et de polynévrite périphérique.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1922. Jan. 19. Year 38. 3rd Ser. No. 2. pp. 117-124.

The appearance of Addison's disease and of nervous symptoms, namely right optic atrophy with pain and wasting in the left limbs but without loss of sensation or deep reflexes, occurring in the absence of a positive Wassermann reaction, "appear to be attributable solely to chronic malaria. . . . Radiological examination was completed by the study of the suprarenal by Carelli's method (insufflation of the perirenal sheath) carried out on the left side only, which showed a small suprarenal and the existence of fibrous adhesions."

C. L.

CARDARELLI (Aldo). **Sindrome meningitica nella terzana primaverile.** [Meningitic Syndrome in Vernal Tertian Malaria.]—*Giorn. di Med. Milit.* 1921. Dec. Vol. 69. No. 12. pp. 623–624.

A case of fever with opisthotonos but full consciousness was diagnosed as cerebro-spinal meningitis until a normal thecal fluid led

to investigation of the blood, with the discovery of benign tertian parasites, the remains of an infection obtained on the Piave front a year earlier. His symptoms disappeared rapidly under quinine.

C. L.

Barabaschi (Paolo). **Di alcune complicazioni gravi della malaria.** [Some Grave Complications of Malaria.]—*Gaz. d. Ospedali e d. Clin.*. 1922. Feb. 19. Vol. 43. No. 15. pp. 171–172.

About the Adriatic the Great War brought to the writer's notice three grave forms of malaria: (1) a Macedonian and Albanian with haemolysis, icterus and an enormous and persistent splenomegaly; (2) a grave anaemia leading on to gastric ulcer, with all its symptoms and risks; (3) the lighting up of a pre-existent thoracic tuberculosis.

C. L.

Guthrie (J. Birney). **Malarial Infection as a Possible Cause of Symmetric Gangrene of the Extremities with Report of a Case.**—*New Orleans Med. & Surg. Jl.* 1922. Mar. Vol. 74. No. 9. pp. 604–612.

A mulatto labourer of 22 was admitted to hospital for intense throbbing pains in the hands and feet, and abdominal cramps. He had a positive Wassermann reaction following a chancre in the previous year, malaria of mixed tertian and subtertian types, marked albuminuria, and cold hands and feet, with local discolorations later going on to sloughing; blood pressure reached 100 mm.; there was no thickening or evident occlusion of arteries. In the discussion which followed the reading of the paper there was no acceptance of the view that the cause of the vascular condition was malaria.

C. L.

Squarti (Guido). **Sindromi nervose poco comuni nella malaria dei bambini.** [Rare Malarial Nervous Syndromes in Children.]—*Policlinico.* Sez Prat. 1922. May 1. Vol. 29. No. 18. pp. 571–577.

This is more a compilation than an expression of individual experience. The nervous symptoms which occur in children, not merely at the time of and, as one may say, in place of the rigor, but at any period of the asexual cycle, are collected into various syndromes, such as comatose, eclamptic, tetanic, meningeal and polyneuritic, the last being held to be an essentially circulatory disturbance resulting from parasitic localization, and the consequent changes in vessel walls and nervous elements. In treatment, preference is given to oral over rectal administration, "hypodermic" injection being reserved for grave cases. The bibliography comprises Italian and French works.

C. L.

Chimisso (L.). **Contributo epidemiologico e clinico sull' infantilismo malarico.**—*Riforma Med.* 1922. March 13. Vol. 38. No. 11. pp. 241–243. With 3 figs. in text.

Three striking cases, with photographs, of infantilism with enlarged spleen and malaria are here described—males of 18, 24 and 23 having heights of 4 ft. 7¼ in, 4 ft. 4½ in. and 4 ft. 1 in., and having not yet

attained puberty. The first of them had, however, seven years later, achieved a height of 5 ft. 5 in., acquired a satisfactory physique, and accumulated a family.

C. L.

Tezzo (Paolo). **Lesioni epatiche nella malaria.**—*Giorn. It. Clin. Med.* Parma. 1921. June 30. Vol. 2. No. 10. pp. 361–365.

Hepatic malarial lesions are the result of an inflammatory process. Treatment and prophylaxis must avoid excessive stimulation of the liver functions. A careful examination of hepatic function should always be made before proceeding to a systematic treatment of chronic malaria, especially by the modern method with Ehrlich's salts.

J. Rosslyn Earp.

Ionesco (D.) & Poppel (M.). **La cirrhose hépato-splénique paludéenne.**—*Presse Méd.* 1922. June 3. Vol. 30. No. 44. pp. 477–478.

As long ago as 1871 Lancereaux described a malarial hepatic cirrhosis with enlarged spleen and jaundice. The cirrhotic type found in Roumania occurs in anaemic cachectics, with enlarged abdomen containing a big spleen, ascites, obvious evidence of venous portal obstruction, but without increased size of the liver, jaundice or pigmentation. There is oedema of the lower limbs. The liver shows obvious fibrosis, which microscopically is almost entirely extralobular and is accompanied by formation of new biliary canals, by hyperplasia and usually pigmentation of Kupfer's cells. There is also hyperplasia of the splenic connective tissue, congestion of its sinuses, and accumulation of pigment in its endothelial cells. It suggested that the hepatic trouble is secondary to splenic changes and that the rational treatment would be splenectomy.

C. L.

Mendelson (Ralph W.). **A Genuine Case of Malarial Polyneuritis.**—*Jl. Trop. Med. & Hyg.* 1922. June 1. Vol. 25. No. 11. pp. 139–140. With 1 text fig.

A Siamese man was brought to hospital unconscious on the third day of an illness characterized by progressive paralysis of all the limbs. The blood showed a severe infection with *Plasmodium falciparum*. After 40 gr. of quinine administered intravenously he recovered consciousness but with paralysis of the limbs, complete in the lower, incomplete in the upper. There was no sensory change, subjective or objective. Deep reflexes were absent, except the left wrist jerk. Wassermann's reaction was negative, although the "heart revealed a compensating mitral stenosis." Beriberi is ruled out by the sudden onset, alcohol by the history of the case. There being no history of lead, mercury, arsenic, silver or ergot, a process of exclusion and the presence of *P. falciparum* determine the diagnosis.

C. L.

Gros (H.). **Un cas sporadique de paludisme autochtone.**—*Bull. Soc. Path. Exot.* 1922. Apr. 12. Vol. 15. No. 4. pp. 191–193.

An old lady of 74, who had evidently never left France, had a tertian fever at 8 years old, influenza with pain in the left hypochondrium at

73, and a quartan fever at 74. A first blood examination was negative; a second revealed, in six stained slides, a single body in a red corpuscle with nine merozoits. "Malaria cannot accordingly be questioned." The only other known case in the neighbourhood was the old lady's son-in-law, who had, four years earlier, an infestation with *P. vivax*. The conclusion reached is that a carrier of *P. vivax* has communicated, to one who has never left the country, *P. malariae*; and that this circumstance, if verified, has the value of an experiment and will constitute a certain proof of the specific unity of the Plasmodium of malaria. [But the gaps in the argument require for their surmounting a degree of mental courage or agility with which we are not all endowed.]

C. L.

Genevrier **Le traitement moderne du paludisme et sa stérilisation par les injections intraveineuses de quinine.**—*Presse Méd.* 1922. May 20. Vol. 30. No. 40. pp. 431–432.

The writer's attitude is distinctive. He is one of those who hold that malaria is divisible into three stages: the first before gametocytes form, a period put at from 10 to 12 days, and one during which the organism is held to be particularly vulnerable; a third in which visceral sclerosis has occurred, with cachexia and anaemia, a stage in which treatment is practically useless; and a second, intermediate, stage. His views regarding treatment are equally definite. Intravenous quinine is an integral part of his routine treatment, in doses of 1·2 to 1·4 gm. on the first, third and sixth days, while cacodylate of soda is injected subcutaneously on the second, fourth, fifth, and thereafter daily for the seventh to the eighteenth days. Quinine, 1 gm. by mouth, is given once or twice a day, but with absolute cessation on the eighth, ninth and tenth, and again on the thirteenth, fourteenth, fifteenth and sixteenth days. The paper omits any reference to the kind of malarial parasite concerned, or to the actual results obtained.

C. L.

Maxcy (Kenneth F.). **Limitations to the Use of Quinine Intravenously in the Treatment of Malaria.**—*Public Health Rep.* 1922. Mar. 24. Vol. 37. No. 12. pp. 693–701.

There is no evidence [*cf.* Acton, this *Bulletin*, 1921. Vol. 18. pp. 335–8] that disinfestation in malaria is more readily obtained by intravenous than by oral administration of quinine. Intravenous quinine produces, if given rapidly, a fall, possibly dangerous, in blood pressure. It causes, if there be leakage, as there may be in the most careful hands, cutaneous necrosis very slow to heal, nerve necrosis with paralysis, and [possibly vascular necrosis with] thrombosis. It may be followed by certain nervous symptoms. The intravenous route should accordingly be reserved for those cases with urgent clinical indications, or those in which oral administration is impracticable; if used the dose should be of 5 gr., and twelve should be looked upon as the maximum; and it should be so diluted that 1 cc. of solution contains not more than half a grain of the drug, and so given that the rate of administration does not exceed 1 cc. per minute, adrenalin solution being injected if the blood pressure fall.

C. L.

Seguin. **Du traitement du paludisme, maladie essentiellement curable (2e communication).**—*Bull. Soc. Path. Exot.* 1922. Apr. 12. Vol. 15. No. 4. pp. 237–246.

Dr. Seguin has received a number of protests to his statement that, in the absence of reinfection, quinine is a certain specific for malaria within 10 days if gametocytes have not formed, within 60 days if they have. He describes nine illustrative positive cases.

C. L.

Mathieu. **Note sur le traitement du paludisme par la quinine.**—*Arch. Méd. et Pharm. Nav.* 1922. Mar.–Apr. Vol. 112. No. 2. pp. 97–111.

This note is based on observations made upon 117 malarial army invalids during three voyages between Beyrouth and Toulon, each voyage occupying two to three weeks. The prevention of clinical relapses during these short voyages was best obtained by administration of 3 gm. of quinine hydrochloride daily, but this dose produced two cases of haemoglobinuria. Some particularly deplorable sequelae to intramuscular injections of quinine were put on board which, as the writer points out, are only to be expected when this procedure is delegated to nurses and orderlies.

C. L.

Mayer (Martin). **Die Behandlung der Malaria.** [Treatment of Malaria.]—*Klin. Woch.* 1922. Mar. 11. Vol. 1. No. 11. pp. 527–529.

This contribution to a clinical journal naturally contains statements of personal opinion and experience without evidence offered to support them. The treatment recommended is that of Nocht, of the Tropical Diseases Institute at Hamburg, from which institution Martin Mayer sends his paper. It consists of 1 gm. daily, divided into four or five equal fractions. Intramuscular injection in doses of 0·5 gm. is advised for cases where the stomach is upset, while for grave cases the route should be intravenous and, to avoid collapse, limited to 0·3 or as a maximum 0·5 gm. For disinfestation a daily dose of 1 gm. on five consecutive days of each week and continued for six or eight weeks is advised. These doses refer to quinine hydrochloride; if the sulphate be used the daily dose should be increased to 1·12, and if the tannate to 2·5 gm.

C. L.

Wright (Thomas E.). **Suggestive Mixed Treatment in Chronic Malaria.**—*New Orleans Med. & Surg. Jl.* 1922. Mar. Vol. 74. No. 9. pp. 612–616. (Discussion pp. 616–618.)

Drawing attention to those chronic malarias which resist treatment, the writer draws analogies with syphilis and explains them as being due to the hypothetical formation of "multiple foci just outside the peripheral blood. A treatment giving a rapid and decided plasmodiacidal effect, together with a substantial penetrating effect as regards the multiple foci, is one rather to be desired." The following treatment is recommended. Daily for from 4 to 6 days 20 gr. of "quinine," half by mouth, half intravenously. Thereafter the same daily dose twice a week for two or three weeks. The economic loss resultant

on chronic malaria is insisted upon. In subsequent discussion Bass urged that a technique involving intravenous medication is rarely justified. Ledbetter emphasized those rare comatose and black-water cases where quinine is not absorbed. Tilling distinguished between quinine by "mouth" and quinine in solution, the former term apparently referring to administration in solid form.

C. L.

Reh (Max). **Zur Behandlung der Malaria.** [The Treatment of Malaria.]—*Muench. Med. Woch.* 1922. Mar. 31. Vol. 69. No. 13. pp. 470–471.

On the strength of 18 per cent. of relapses in 29 cases treated during 1919 by his own technique as compared with 33 per cent. of relapses in 49 cases treated during 1918 by Nocht's technique, the writer advises his own. It is as follows: For 60 hours give at two-hourly intervals 0·2 gm. of quinine, night and day. Repeat the course after a pause of one or two days. Then administer during 15 days a course of quinine and arsenic pills, on the 5th, 6th, 10th and 11th days, giving in addition 0·2 gm. quinine morning and evening.

C. L.

Suzuki. **Sur la quinothérapie dans le paludisme des enfants.**—*Arch. Méd. des Enfants.* 1922. Jan. Vol. 25. No. 1. pp. 1–14. With 4 charts.

Experiments on rabbits showed that quinine hydrochloride was most toxic if given intravenously, and progressively less so if administered intramuscularly, rectally, subcutaneously and orally. In rectal administration the concentration of the solution was immaterial. The minimal lethal doses are not here reproduced, since their selection appears to be arbitrary. Further, the effect of different salts of quinine upon bacilli of the coli group is held to be indicative of their effect upon Plasmodia. Finally, in describing the rectal administration of quinine, in malaria of apparently undetermined type, to children of 13, 2½, 9 and 6, the writer highly commends this route.

C. L.

Nagger (S. B.). **Treatment of Malaria in Pregnant Women and Newly-Born Children.**—*Practitioner.* 1922. June. No. 648. Vol. 108. No. 6. pp. 441–442.

The treatment recommended in these cases is the intravenous or intramuscular injection of 914. "Four injections (0·4 gm.) were found quite enough for curing the fever, anaemia and debility."

C. L.

Hele (T. S.). **Malaria in Macedonia, 1915 1919. Part IV. Chemical Investigations on the Excretion of Quinine by Soldiers in Macedonia.**—*Jl. Roy. Army Med. Corps.* 1922. Apr. Vol. 38. No. 4. pp. 251–266.

The investigations here detailed were curtailed by the late arrival of apparatus and by the cessation of possibilities for work. In no instance was there more than a trace of quinine recovered from the faeces,

although stomach washings showed its presence after both intravenous and intramuscular injections. There was evidence of more rapid absorption from a healthy alimentary canal then from muscle. Excretion by the kidneys was most rapid in the first half-hour after administration, was negligible after three days, and in no case amounted to more than from 10 to 30 per cent. of the quantity ingested. In six cases of haemoglobinuria in which urine was freely secreted, the excretion of quinine differed little from the normal. In a case with suppression of urine the drug, naturally enough, remained in the body. Interesting points in two autopsies were the recovery of quinine from the liver three hours after death at the rate of about 10 per cent. of the total amount administered during life, the proportion being in one case reduced by half 24 hours later; and the recovery of considerable quantities from the glutei, presumably from the site of injections, which had in fact been made previously into the buttock.

C. L.

Dupérié (R.) & Obrenovitch (E.). **La résistance globulaire dans le paludisme secondaire.**—*C. R. Soc. Biol.* 1922. May 6. Vol. 86. No. 16. pp. 945–946.

In 118 malarial cases infected with the various parasites, the proportions of the different single and of mixed infestations being unindicated, 58 per cent. showed an increase in the fragility of the red corpuscles, the remaining 42 per cent. being of normal or supernormal resistance. Fragility was greatest, 83 per cent., in mixed infections of *Plasmodium vivax* and *P. falciparum*; was 62, 55 and 47 per cent. respectively in cases harbouring *P. falciparum, P. vivax*, and in those in which no Plasmodium was detected after repeated examinations of the blood. In none of these instances are the actual numbers involved mentioned, nor is this done in support of the statement either that fragility is increased during the phase of the parasites' maturity, during the apyrexia preceding a paroxysm, and while gametocytes exist; or that it is normal or increased at other times. Quinine was not found to influence this condition.

C. L.

Jancsó (Nikolaus). **Experimentelle Untersuchungen ueber die Malariainfektion des Anopheles und des Menschen beeinflussenden Umstände.** [Researches on the Circumstances influencing Malaria Infection of Anopheles and Man.]—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1921. Vol. 25. Beiheft 2. pp. 5–48. With 9 text figs.

In these experiments, carried out between the years 1901 and 1905, 22 *Anopheles maculipennis*, infected from 18 cases of tertian malaria, inoculated 22 persons with the same infection. Corresponding figures for quartan malaria were 18, 13 and 3; and for subtertian 69, 22 and 43. In the case of the last, crescents appeared on the sixth day after inoculation. The cases are described at length, considerable but nevertheless insufficient for their purpose. Perusal of the paper leaves the impression that it cannot be the present-day scientific value of these twenty-year-old observations which has prompted their publication now at such obvious expense.

C. L.

Bass (C. C.). **Studies on Inoculation of Experimental Animals with Malaria.**—*Amer. Jl. Trop. Med.* Baltimore. 1922. Mar. Vol. 2. No. 2. pp. 107–114.

Pointing out that although horses, mules, dogs, monkeys, rabbits, mice, guinea-pigs, hedgehogs, bats, wolves, cats, pigeons, doves, magpies, screech-owls, turtles, frogs and lizards have been inoculated with human malarial blood, infection has never been transmitted except in the case of the chimpanzee, and then only with *Plasmodium vivax* and with survival only for ten days, Bass reports inoculation of three guinea-pigs, four rabbits and one *Macacus rhesus* with *P. falciparum*. He has checked the results by culturing Plasmodia from the same case in a medium made with the serum of each of these experimental animals, while as controls similar cultures with human sera were made. All the controls succeeded, all the other experiments failed, Plasmodia disappearing from the blood of experimental animals within 24 hours except in the case of one guinea-pig, in which they persisted over that period but had disappeared in 48 hours. No illness followed the inoculations. It is concluded that these animals are resistant to, and probably immune from, human malaria.

C. L.

Chimisso (Luigi). **Su un plasmodio della malaria di scimmia** (*Macacus rhesus*).—*Haematologica.* Naples. 1922. Feb. Vol. 3. No. 1. pp. 38–54. With 1 plate.

A *Macacus rhesus*, probably coming from India, and used for experimental purposes not indicated in the communication, was found to be suffering from infestation by a Plasmodium. Constant examination of blood films revealed rings of various sizes with decoloration of erythrocytes and absence of Schüffner's dots. Sporulating forms were never found in the peripheral blood, although after death some appear to have been detected from spleen and liver, but are not described. The attention of systematists will doubtless be mainly attracted by the statement that, apart from difference of sex, there are described five different forms of gametocyte, one resembling human tertian malaria, one resembling quartan, a "semilune-simili," a "pseudo-semilune," and an ovoid. The beautiful coloured plate and the writer's definiteness render it scarcely possible that it can be lack of conviction which, after all, leaves the creature zoologically nameless.

C. L.

Leger (Marcel). *Plasmodium* **d'un Singe de la Guinée française** *Cercopithecus campbelli* **Wath.**—*C.R. Soc. Biol.* 1922. Apr. 29. Vol. 86. No. 15. pp. 837–840. With 6 text figs.

Plasmodium bouilliezi, deemed to be a new species, was found in the heart's blood of this ape, freshly killed. It is held to differ from *P. kochi* in the following particulars. Its host comes from West and not from East Africa. The young parasite is not annular but elongated, with protoplasm compact and nucleus practically non-existent. The schizont, held to be adult, is pigmented and non-amoeboid, and measures 2·5 to 3μ in diameter. The macrogametes cause an enlargement of the erythrocyte, have a diameter of 7·5 to 8·5μ, a vesicular non-staining nucleus, a dense caryosome and coarse olive-green

pigment, uniformly distributed. The microgametes, about a quarter as numerous and somewhat smaller than the macrogametes, are often deformed, have a large diffuse nucleus and a number of chromatin granules about one pole. These are figured, but the writer has unfortunately omitted the legend, nor has he indicated his reasons for holding that the "excessively rare" schizonts have a cycle which cannot be brought into agreement with that of *P. kochi*.

C. L.

Blacklock (B.) & Adler (S.). **A Parasite resembling *Plasmodium falciparum* in a Chimpanzee.**—*Ann. Trop. Med. & Parasit.* 1922. Mar. 31. Vol. 16. No. 1. pp. 99–106. With 1 plate.

In a chimpanzee at Freetown in West Africa the authors found a parasite, both small rings and crescents, morphologically indistinguishable from *P. falciparum*, and apparently identical with that described by Reichenow as occurring in the chimpanzee and gorilla, and stated by him to be the human parasite [see this *Bulletin*, Vol. 17, p. 146]. The authors tried to infect *Anopheles costalis*, and also to transmit the infection to two Europeans, but were not successful.

In the same chimpanzee some large amoeboid forms resembling *P. vivax* in enlarged pale red cells, and some large band-shaped equatorial forms resembling *P. malariae* were found in small numbers on two occasions.

The animal also suffered from dysentery, and passed large numbers of Strongyloides larvae and cysts resembling *Blastocystis hominis*.

When in course of time it died, the immediate cause of death appeared to be a heavy infestation of both lungs with Strongyloid larvae, an account of which is forthcoming.

A. A.

i. Genovese (Francesco). **La Malaria in Provincia di Reggio Calabria.**—*Malariologia*. 1921. Apr. 30 & June 30. Ser. 1. Vol. 14. Nos. 1–2 & 3. (Ser. 2. Vol. 7. Nos. 1–2 & 3.) pp. 3–41. With 5 text figs. and pp. 51–72.

ii. Brauns (W.). **Zwei Krankheitsfälle mit malariaähnlichem Fieber.** [Two Cases with Fever resembling Malaria.]—*Deut. Med. Woch.* 1922. Mar. 3. Vol. 48. No. 9. p. 287.

iii. Stéfaloyannis. **Paraplégie palustre.**—*Jl. des Practiciens*. 1922. Jan. 21. Vol. 36. No. 8. p. 40.

iv. Comessatti (Giuseppe). **Osservazioni cliniche e Terapeutiche sulla malaria.**—*Il Morgagni*. 1922. Jan. 31. Vol. 64. Parte 1 (Archivio). No. 1. pp. 1–53. With 2 plate-figs.

v. Bass (C. C.). **The Standard Treatment for Malaria recommended by the National Malaria Committee.**—*Bull. Soc. Path. Exot.* 1922. Mar. 8. Vol. 15. No. 3. pp. 169–178.

i. These observations, considering in detail the geology, hydrography, forestation and malarial distribution of Calabria, appear to have a purely local interest.

ii. In two instances there occurred fever, in the one of a tertian, in the other of a quartan type. They disappeared after the administration of quinine. The first occurred during an epidemic of influenza; the second patient had diphtheria. Plasmodia were not found in either.

iii. A man became paraplegic during a malarial attack and recovered after two series of intravenous injections of quinine. Whether the blood was examined or syphilis excluded is unstated.

iv. In this full clinical treatise the writer records his agreement with text-book descriptions of the subject.

v. This communication, with its French summary, brings to the notice of Frenchmen the Standard Treatment advised by the National Malarial Committee of the United States, and familiar to readers of this *Bulletin*.

C. L.

Jiménez (Rafael Medina). **El Paludismo en el Estado Zamora.** *Gac. Med. de Caracas.* 1921. Dec. 15. Vol. 28. No. 23. pp. 351–365.

Peutz (J. L. A.). **De behandeling van gevallen van malaria. Welke niet door chinine genezen.**—*Nederl. Tijdschr. v. Geneesk.* 1921. Aug. 13. Year 65. 2nd Half. No. 7. pp. 854–856.

Nieuwenhuijse (A.). **Malaria en behandling der hardnekkige gevolgen.** [Correspondence.]—*Ibid.* Nov. 12. No. 20. p. 2518.

LEPROSY.

CATANJAL (Andres). **Culion Leper Colony, Philippine Islands.**—*Jl. Philippine Islands Med. Assoc.* 1921. Sept.–Oct. Vol. 1. No. 5. pp. 191–195.

The author is a member of the Philippine Health Service, so writes with authority in reviewing fourteen years' segregation of lepers at Culion, beginning in the second half of 1906. His first table shows the deaths caused by leprosy in the Philippines in 1903 and 1918 as 199 and 130 respectively, the latter figure including 87 deaths at Culion; but excluding Culion, Palawan Province, to which the lepers were transferred, they have been reduced by 1918 to only 21·60 per cent. of the figure of 1903. If the Culion colony is included the number of deaths from leprosy after twelve years' enforcement of segregation was reduced to 62·32 per cent. of the number in 1903, three years before segregation. The yearly admissions to the colony during the four years ending 1917, as compared with those of the first three and a half years, also show a reduction to 66·91 per cent. of the earlier figures. (It must be allowed that the admissions during the first three and a half years were unduly high owing to special efforts then made to isolate as many lepers as possible). The mortality among the segregated lepers has steadily fallen, which disproves the alleged deficiencies of the food supplied. Considering the comparatively short time the colony has been in existence the above official account affords satisfactory evidence of the beneficial results of the segregation policy [see also this *Bulletin*, 1922, Vol. 19, page 388].

Leonard Rogers.

BODAAN (L.). **Leprosy among the Karo-Bataks and the Way of Combating it.** (With a Preface by Prof. Dr. W. SCHÜFFNER.)—*Meded. Burgerlijk. Geneesk. Dienst. in Nederl.-Indië.* 1922. Pt. 1. pp. 1–24. With 45 figs.

This is an interesting account by the Missionary in charge of a leper village settlement in Java, where voluntary isolation is carried out, with illustrations of the houses, etc. Although it contains no medical data of value it presents a good example of what can be done for lepers by tactful and sympathetic treatment.

L. R.

DA MATTA (Alfredo). **Notas sobre a lepra no Amazonas.**—*Brazil Medico.* 1921. June 4. Year 35. Vol. 1. No. 23. pp. 287–291.

The author draws attention to the gravity of the position as regards leprosy in the State of Amazonas, and to the entire inadequacy of the present provision for dealing with it. In February, 1908, the Government established a small "pseudo-colony" (da Matta) for lepers at Umirisal on the left bank of the Rio Negro. Entirely exaggerated reports as to the size and efficiency of the scheme spread through Amazonas and the territories bordering it, and lepers from all parts of the State and from beyond its boundaries flocked to Umirisal under the impression, unfortunately quite mistaken, that there was there a model establishment able to accommodate a large number of sufferers from the disease. In 1919 power was given to the executive to acquire land for the purpose of founding a leper colony, but up to the present nothing has been done.

The author is of opinion that there are at present from 800 to 1,000 lepers in the State of Amazonas. In a brief discussion of the history of leprosy in America he maintains that the disease is of European introduction. Leishmaniasis (uta) and blastomycosis (espundia) were well known to, and are clearly described by, the Incas; no description of leprosy, however, is, according to the author, to be found in Inca sources. Further, the disease is extraordinarily rare among the aboriginal population, the author having, in the course of 26 years, met with only two cases in Indians.

F. S. Arnold.

Sanders (J.). **[La Lèpre. Rapport au Conseil d'hygiène des Pays-Bas.]**—*Versl. en Mededeel. Betr. de Volksgezondheid.* 1921. Nov. [Summarized in *Bull. Office Internat. d'Hyg. Publique.* 1922. Mar. Vol. 14. No. 3. pp. 303–305.]

In 1920, 19 lepers were known in Holland, 16 males and 3 females, 4 being in hospital and 9 in a satisfactory state at their homes, where precautions were being taken to avoid others being infected. Only one had apparently contracted the disease in Holland, from a brother from Guiana, and the rest were imported cases from Guiana and the Dutch Indies, in the latter of which compulsory notification has been in force since 1917. Recently leper villages subsidized by Government in the Dutch Indies, containing 770 sick, have been found more effective than asylums, and progress is being made in prophylaxis. In Dutch Guiana there are 1,500 lepers among 120,000 population, but the legal powers of compulsory segregation have not been enforced. The author agrees with Hansen that leper asylums should not resemble prisons and be enclosed by walls.

L. R.

de Magalhaes (Afredo). **Kann Lepra spontan heilen?**—*Dermat Wchnschr.* 1921. Aug. 13. Vol. 73. pp. 857–859.

The spontaneous healing of leprosy is well known, especially in nerve cases, and a case is recorded of 15 years' duration which became stationary and the patient lived for 40 years. Two cases of tubercular leprosy of 20 and 30 years' duration with healing are quoted and others referred to.

L. R.

Laporte. **Trois cas de lèpre dans un régiment de tirailleurs sénégalais.**—*Arch. Med. et Pharm. Milit.* 1921. Nov. Vol. 75. No. 5. pp. 373–378.

Medicin-Major Laporte describes three cases of leprosy found in a regiment of Senegalese on the Rhine, one of which showed numerous lepra bacilli, while the other two were early anaesthetic cases with patches showing loss of pigment and sensation in which no bacilli could be demonstrated, and he points out the danger of infections occurring in Europe from such cases. In 1917 he had to examine two Senegal regiments for leprosy and detected 23 cases, most of whom had leprous relatives in more advanced stages of the disease, and they were repatriated. Some had escaped detection on recruitment through fraudulent representation by substitutes; so search for and repatriation of such early cases among African regiments is very necessary.

L. R.

PERKINS (Granville A.). **The Preparation of Certain Drugs used in the Treatment of Leprosy.**—*Jl. Philippine Islands Med. Assoc.* 1921. Mar.–Apr. Vol. 1. No. 2. pp. 62–67.

A brief summary of work on the chemical composition of chaulmoogra, hydnocarpus and codliver oils is given from MOSS's work in 1879, including the recent use of soluble preparations in the treatment of leprosy and tuberculosis. The author concludes with the suggestion that it may prove possible to make a still more effective drug by properly combining a toxic element like arsenic or antimony with a fatty acid, if WALKER's idea of the absorption of toxic fatty substances by acid-fast bacilli is correct, while if ROGERS is right in believing in the efficacy of unsaturated fatty acids in general a less expensive preparation than those of chaulmoogra oil may be obtained from some of the available very highly unsaturated fatty acids.

L. R.

OHARA (M.). **Pharmacological Studies of a Few Derivatives of Chaulmoogra Oil.**—*Japan Med. World.* Toyko. 1922. Jan. 15. Vol. 2. No. 1. pp. 1–4.

The author has made a pharmacological study of sodium gynocardate, gynocardate ethylester, and of gynocardate iodoethylester made in his laboratory, method not stated. The last two are not readily soluble in water, so saturated solutions of both were prepared with Ringer solution, from which various dilutions were made, 100 cc. containing 0·0054 gm. of iodoethylester and 0·00177 gm. of the ethylester respectively. The lethal doses per 10 gms. of the frog for each of the 3 preparations were respectively 0·01 gm. of sodium gynocardate, 0·05 gm. of the ethylester, and 0·03 gm. of the iodoethylester. The conclusions arrived at were :—

CONCLUSIONS.

"1. Sodium gynocardate, gynocardate ethylester and gynocardate iodoethylester produce the central paralysis. The toxic action is more marked in sodium gynocardate, the next is iodoethylester, and the least is ethylester.

"2. On isolated frog heart the iodoethylester had almost no action, but ethylester has a slight paralytic action.

"3. They have inhibitory actions on the isolated rabbit intestine. On rabbit uterus they have stimulating action. They seem to act on the muscles themselves. The action of gynocardate iodoethylester is the weakest.

"4. On the blood vessels all three drugs have contracting action. In diluted solutions they seem to have dilating action on the rabbit ear vessel.

"5. On the blood pressure sodium gynocardate has a transitory lowering and then recovers, while the other two drugs have only lowering action. This action is a peripheral and not a central action."

L. R.

CAWSTON (F. G.). **Antimony in the Treatment of Lepers and Hydatid Disease.**—*Jl. Trop. Med. & Hyg.* 1922. Feb. 1. Vol. 25. No. 3. pp. 27–28.

In three or four lepers treated with 1·3 cc. doses of Oppenheimer's colloidal antimony, the ulcers healed and paralytic symptoms improved,

but in one early anaesthetic case no change had occurred after a month. In two more Indian lepers in which the intramuscular doses were pushed up to early antimony poisoning the ulcers dried up and one was reported in good health a year later.

L. R.

Gujo (Koretake) & Chuma (Masaru). [**A Histological Study on the Leprous Tissues by Vital Staining.** — *Osaka Igakkwai Zasshi* (*Jl. of Osaka Med. Soc.*). 1921. Nov. Vol. 20. No. 11. [Summarized in *Japan Med. World.* Tokyo. 1922. Mar. 15. Vol 2. No. 3. p. 79.]

Leprous nodules chiefly consist of histoblasts, *i.e.*, epitheloid, follicular and giant cells, the follicular being epithelioid cells formed after they have digested the lepra bacilli, while the giant cells originate from the histoblasts and differ from those of tubercle in always resembling bone marrow cells.

L. R.

Greenbaum (S. S.) & Schamberg (Jay F.). **Demonstration of Lepra Bacilli by Aspiration of Nodules.**— *Jl. Amer. Med. Assoc.* 1922. Apr. 29. Vol. 78. No. 17. pp. 1295–1296. With 1 text fig.

In leprotic infiltration of the hypodermic tissues where for any reason excision of a nodule cannot be done, acupuncture is a simple and practically painless method of demonstrating the lepra bacillus. A tightly fitting small record syringe containing a few drops of sterile water or saline is passed into a nodule which has previously been submitted to light massage, the fluid is injected and drawn in and out of the syringe several times to emulsify the tissues, and slides are then made with the fluid and stained by the Gram and Ziehl-Neelsen methods. In 100 per cent. typical groups of acid-fast bacilli in intracellular clumps and separate, as well as granules, will be found which are diagnostic of leprosy, for very few occur in lupus. The bacilli may also be found in enlarged subcutaneous lymph nodules and sometimes also in macules.

L. R.

Brito Fontes (A. de). **La réaction de fixation du complément avec le sérum de lépreux et l'antigène tuberculeux de Besredka.**— *C.R. Soc. Biol.* 1922. Feb. 11. Vol. 86. No. 6. pp. 331–332.

Since Eitner, in 1906, obtained the Wassermann reaction in leprosy various antigens have been found to give reactions with the blood of lepers, while they are also sensitive to injections of tuberculin. The present author has tested Besredka's tubercular antigen by the complement fixation test with the blood of 19 lepers in the Lisbon leprosarium, using the technique of Kuss and Rubinstein and, as controls, the sera of known tubercular cases with negative Wassermann reactions, the bloods being obtained 24 hours before the tests were made. Positive reactions were obtained with 8 men and 8 women, and negative ones in 2 men and 1 woman, or 84·2 per cent. of positive results.

L. R.

Turkhud (D. A.) & Avari (C. R.). **Gaté-Papacostas Reaction in Leprosy.**—*Indian Jl. Med. Res.* 1922. Apr. Vol. 9. No. 4. pp. 850–851.

Gaté and Papacostas accidentally discovered that two drops of commercial formalin added to 10 cc. of clear syphilitic serum in a small test-tube formed a jelly-like mixture within 24–36 hours and that this "Formol-Gel" test coincided with the Wassermann reaction in 85 per cent. of cases. In the Bombay laboratory the writers have compared the Wassermann and formol-gel reactions. Of 186 bloods 44 gave positive Wassermanns, and only 30, or 68 per cent., gave a plus formol-gel test, and of 15 with a — Wassermann none gave a + formol-gel one. Of 124 negative Wassermanns 8 gave a + formol-gel reaction; no less than 6 of the 8 were lepers. This led them to examine the bloods of 116 lepers in the Ackworth Leper Asylum, and every one of them gave a positive formol-gel reaction with inactivated serums, so they think it is likely to prove a valuable test for leprosy.

L. R.

Marchand (H.). **La cholestérinémie des lépreux.**—*Bull. Soc. Path. Exot.* 1922. Mar. 8. Vol. 15. No. 3. pp. 159–160.

Estimations have been made of the cholesterin in the blood of four lepers and found to vary much as in syphilis, being about normal in an early case, 1·60 gm., but reduced to from 1·20 to 1·25 in three advanced cases. In one of these it rose to 1·50 gm. after intensive treatment with chaulmoogra oil, so further observations on a larger number of cases in relation to treatment would likely be of interest. Grigant's calorimetric method was used in the tests.

L. R.

Maië (Shin). **Experimentelle Versuche bei Goldfischen** (*Carassius auratus*) **mit säurefesten Bazillen.** [Experimental Researches on Goldfish (*C. auratus*) with Acid-fast Bacilli.]—*Cent. f. Bakt.* 1. Abt. Orig. 1922. Mar. 14. Vol. 88. No. 1. pp. 28–38.

Material containing leprosy bacilli in the lesions and nasal secretions of a leper were inoculated into goldfish and the bacilli multiplied and developed in the brain, while intraperitoneal and subcutaneous injections resulted in the bacilli being found in the brain, liver, spleen and nerves, remaining unchanged without increase for three to four months in the nerves, spleen and genital organs. In only one case was phagocytosis of the bacilli in the brain seen. Inoculation of the nasal secretions did not produce dissemination.

L. R.

Uchida (M.). **Studies on Rat Leprosy.**—*Japan Med. World.* Tokyo. 1922. Jan. 15. Vol. 2. No. 1. pp. 4–7.

— —. [**A Report on the Study of Rat Leprosy.**]—*Tokyo Iji Shinshi* (*Tokyo Med. News*). 1921. Nov. No. 2252. [Summarized in *Japan Med. World.* Tokyo. 1922. Mar. 15. Vol. 2. No. 3. pp. 75–76.]

During the examination of 427,000 rats in Tokyo 30 cases of rat leprosy were found, or 1 to 14,000 rats, which is an underestimate, as only those showing depilated areas and acid-fast bacilli in smears

from the inguinal glands were examined. They were all in *Mus decumanus* (*Epimys norvegicus*), as in most of the recorded cases. The area of skin affection varies from the whole body to small portions, the back being most affected, while in seven ulceration was present; nodules are rare. The glands and subcutaneous tissues are also involved, showing granulation tissue with large cells containing many bacilli. In six cases small hard tubercles were met with in the lungs; in twelve the spleen was enlarged without any nodules being present, and the other organs showed no macroscopical changes, although the bacilli were found in all the organs, muscles, nerves, cord, bone marrow, etc.

Animal experiments showed that young *Mus decumanus* could be infected by inoculation in five to seven months with bacilli in all the organs except the spinal cord, while white rats, mice and French mice only developed slight signs of rat leprosy. Attempts to infect these animals with human leprosy, however, failed, only the glands near the site of injection showing bacilli without any signs of their having multiplied. Smears from rat-fleas (*Laelaps echidninus* Berlese) from leprous rats showed fairly numerous acid-fast bacilli, but they could not be proved to be lepra bacilli, as animals could not be infected from them.

Of many previous attempts to cultivate rat lepra bacilli only those of Hollmann were successful, but Uchida now reports having isolated four acid-fast bacilli from his rat leprosy cases, one of which produced pigment, while each showed slight differences on culture; he found glycerine gelatine with yolk of egg or horse serum to be the best media, and three of them have been kept growing for half a year. Inoculation of rats with the cultures did not produce typical rat leprosy, but with strains 1 and 3 after several months the organisms were found around the nuclei of large mononuclear cells in the neighbourhood of the injection in the skin. Which of these four strains, if any, is the etiological organism of rat leprosy is not yet determined.

L. R.

Biérer (Paul). **Sur un cas de lèpre.**—*Arch. Méd. et Pharm. Milit.* 1921. Nov. Vol. 75. No. 5. pp. 379–381.

Erratum.

Vol. 19. No. 5. Last line of p. 390, for *Guinea* read *Guiana*.

TROPICAL DERMATOLOGY.

Dubreuilh & Joulia (P.). **De l'intertrigo mycosique, forme nouvelle d'epidermophytie due à une levure.** - *Ann. de Dermat. et de Syph.* 1922. Apr. 6th Ser. Vol. 3. No. 4. pp. 145–162. With 2 text figs.

This is a most interesting paper on a form of dermatitis of which a few examples have been reported sporadically, but without anything like the authority of this communication. The genitocrural fold is the most frequent position for the eruption, which occurs usually as deep red patches on the inside of the thigh. The surface is unbroken, smooth, shining as if varnished, sometimes slightly moist. There is no induration or elevation of the patch. Its margins are irregular, with a fine scaly collar of exfoliation, beyond which the skin becomes abruptly healthy. Near this principal patch are found small islets of desquamated skin surrounded by the collar as in the larger patch, which begins in the same way. Vesication, so common in trichophytic patches, does not occur. There is intense itching, worse at night. The same condition may be found in the vulva, and under the breast in fat women. In a nursling a month old the eruption originating in the groin spread, to occupy the whole of the lower part of the trunk and body.

Nine cases are recorded in detail, in all of which the same organism was demonstrated. This occurred as spores and mycelial filaments. The parasite is differentiated from the achorions and the trichophytons by the fact that reproduction is by exogenous spores in this type, and by endogenous sporulation in the other two conditions.

Cultures readily grow on Sabouraud's media, and the organism was shown to be a yeast. Treatment with an ointment, acid sal. 1–2 gm., acid benz. 1 gm., lard 30 gm., is usually rapidly successful.

E. G. Graham Little.

Ota (M.). **Brief Notes on *Epidermophyton rubrum*, Castellani, 1909 (*Trichophyton purpureum*, Bang, 1910) and *Trichophyton violaceum* var. *decalvans*, Castellani, 1913, with Remarks on "Eczema marginatum" ("Tinea cruris seu inguinalis") in Japan and "La Li Tou" or "Parasitic Folliculitis" ("Tinea decalvans" pro parte) of South China.**—*Brit. Jl. Dermat. & Syph.* 1922. Apr. Vol. 34. No. 4. pp. 120–124. With 3 text figs.

The author states that the commonest fungus met with in Japan as causing "Eczema marginatum," "dysidrosis" and "onychomycosis" is the *Epidermophyton rubrum* (Castellani). In three cases of baldness, designated by the local Chinese name "La Li Tou," *Achorion Schönleinii* was demonstrated in two, and *Trichophyton violaceum* in one.

E. G. G. L.

Curasson. **Transmission à l'homme de la teigne du dromadaire.**—*Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1920. Mar. Vol. 2. No. 3. pp. 70–73.

Ringworm is common in the dromedary, and does not cause serious symptoms, nor does it often become extensive. But the disease is

readily communicable to man, and the author was able to demonstrate the fungus in the hair of the beard of several Moorish drivers, as well as in the hair of the dromedaries under their charge.

E. G. G. L

Fontoynont (M.) & Salvat (Pax). **Lésions mycosiques dues au *Saccharomyces granulatus* observées à Tananarive (Madagascar). Leur guérison par le bleu de méthylène.** —*Bull. Soc. Path. Exot.* 1922. Jan. 11. Vol. 15. No. 1. pp. 53–59. With 1 plate.

The authors report two cases of a mycotic affection observed in Tananarivo, caused by the *Saccharomyces granulatus* of Vuillemin and Legrain. The first case, which alone is described in detail, was in a native woman, with multiple ulcers distributed practically all over the body. The ulcers began as swellings which broke down later, and left scars. The general health of the patient progressively declined. One of the swellings was opened and a granular mass the size of a pea shelled out easily. Examination of the mass and of the purulent discharge from the ulcers showed the presence of a saccharomyces identified by Langeron and by the authors with the organism described by Vuillemin and Legrain. Internal administration of methylene blue acted as a specific, when iodide of potassium had failed of effect.

E. G. G. L.

Weidman (Fred D.) & McMillan (Thomas M.). **A Comparison of Ingredients of Ringworm Culture Mediums with Special Reference to American and French Crude Maltose.**— *Arch. Dermat. & Syph.* 1921. Oct. Vol. 4. No. 4. pp. 451–468. With 16 text figs.

Weidman and McMillan endeavour to standardize the growths of various strands of ringworm on culture media, French and American, for it has long been an unfortunate difficulty in classifying ringworms that, unless one was able to get the same media as used in Paris, one could not compare results with any profit. They found that American agar produced the same characteristics as the French, that the method of filtering was unimportant, and that with all the moulds used except the microsporons, American sugars and peptone made no difference. But with the two microsporons tested it was essential to use French peptone and maltose.

E. G. G. L.

i. Noc (F.) & Jouenne. **Les mycétomes à grains noirs du Sénégal.**— *Ann. Inst. Pasteur.* 1922. May. Vol. 36. No. 5. pp. 365–385.

ii. Jouenne. **Un cas de mycétome à grains noirs.**—*Bull. Soc. Méd. - Chirurg. française de l'Ouest-Africain.* Dakar. 1921. Jan.–Feb. 3rd Year. No. 11–12. pp. 16–21.

iii. ——. **Nouveau cas de mycétome à grains noirs.**—*Ibid.* Mar. No. 13. pp. 36–37.

iv. —— . **Un cas de mycétome à grains noirs.**—*Ibid.* May. No. 15. 94–95.

i.–iv. The authors sound a note of warning as to the identification of cases of "mycetoma with black granules," which is a frequent disorder in Senegal. Clinical symptoms are very variable, and comprise the true Madura foot type as well as a diffuse oedema of either

upper or lower limb, and again nodules or infiltrated plaques. The victims are usually subjects of syphilis or malaria, or both; more rarely, of tubercle. Three cases, reported also in ii, iii, and iv, are summarized. In all the same type of organism was noted. Its characteristics on various media are carefully described. The authors conclude that it is to be classed as a *Madurella mycetomi*, and this opinion was supported by LANGERON, to whom the cultures were submitted. Treatment in the earlier phases, before infection of bone takes place, is often quite successful with pot. iod. and novarsenobenzol, combined or not with local application of collargol, and small surgical procedures such as curetting.

E. G. G. L.

SCHMITTER (Ferdinand). *Actinomyces Asteroides* (**Eppinger**) **Isolated from a Madura Foot.**—*Jl. Trop. Med. & Hyg.* 1921. Mar. 15. Vol. 24. No. 6. pp. 79–80.

The patient was a native woman, of the island of Cebu, with a "Madura foot" which was amputated. Attempts to isolate the organism in culture media failed owing to contaminations. Inoculations into guinea-pigs resulted in growths from which pure cultures could be made on various media, and their characteristics are described and the organism identified as above.

E. G. G. L.

MCGEE (H. S.). **Report of a Case of Madura Foot.**—*Southwestern Med.* 1922. Mar. Vol. 6. No. 3. pp. 107–109.

The patient was a Mexican native, aged 40, with a swelling of the left foot resulting, in the first instance, from crushing. Some three years later a nodular growth on the dorsum of the foot was noted and excised, and sections from it were returned from the University of Texas with "a diagnosis of mycetoma."

E. G. G. L.

BASKIN (M. J.). **Primary Actinomycosis of the Skin.**—*Jl. Amer. Med. Assoc.* 1922. May 6. Vol. 78. No. 18. pp. 1367–1368. With 1 text fig.

This is a report of a case of direct inoculation of the skin of the left hand of a trapper of animals. The earliest lesion looked like a boil; this extended and became a nodular mass with discharging sinuses from which the fungus was readily demonstrated. The author advises that the lesion should be freely curetted and dressed with Dakin's solution.

E. G. G. L.

PAGENSTECHER (Gustav A.). **Madura Foot, more properly called Mycetoma.**—*Jl. Amer. Med. Assoc.* 1922. May 6. Vol. 78. No. 18. pp. 1363–1365. With 4 text figs.

A report of two cases, the first in a man aged 54, with a swollen right foot in which numerous sinuses discharging pus were found, from which yellow fungus-containing granules could be demonstrated.

The second was a more advanced case, in the right foot of a man of 47; granules (colour not stated) were found consisting of massed myceleum. No cultures were made.

E. G. G. L.

Montpellier (J.). **Note biologique au sujet des Mycétomes. Essais de vaccinothérapie.** —*Bull. Soc. Path. Exot.* 1922. Jan. 11. Vol. 15. No. 1. pp. 7–8.

This records an attempt at vaccinotherapy in a case of Madura foot, of the variety *Aleurisma apiospermum*. Cultures of *Aleurisma apiospermum* in bouillon, filtered, but without other preparation, were used. During the treatment there were slight rises of temperature, and some local reaction, but the disease was not sensibly affected. Deviation of complement, negative before vaccination, became definitely positive after the fifth injection.

E. G. G. L.

Foot (Nathan Chandler). **Pathology of the Dermatitis caused by *Megalopyge opercularis*, a Texan Caterpillar.**—*Jl. Experim. Med.* 1922. May 1. Vol. 35. No. 5. pp. 737–753. With 2 plates.

This paper was prompted by the ravages of a larval moth, *Megalopyge opercularis*, in Texas, epidemics of widespread dermatitis caused by it occurring in 1913 and 1920. The larva is very like that of the flannel moth, which occurs chiefly in the Northern States. A useful summary of the distribution of urticating caterpillars adds to the value of this paper. Personal experiments with the larva, sent by post from Texas, showed that the venom is contained in the cuticle of the caterpillar as well as in the setae, but not in the long feathery hairs. The nature of the poison is not ascertained definitely, but it is rendered inert by boiling.

E. G. G. L.

Lane (C. Guy). **Dermatitis caused by Oil of Citronella.**—*Arch. Dermat. & Syph.* 1922. May. Vol. 5. No. 5. pp. 589–590.

Oil of citronella is widely used as a preventive of mosquito bites. Dermatitis from its use is rare and Lane describes a case. The patient was a girl of 21. The rash was noted on the next day after application as a follicular papular eruption without any weeping or vesication. It disappeared within a week with soothing lotions.

E. G. G. L.

Pantaleoni (D.). **L'acariasi da grano in Romagna nel 1921.**—*Policlinico.* Sez. Prat. 1921. Dec. 19. Vol. 28. No. 51. p. 1724.

An epidemic of acariasis occurring in the autumn, in Romagna. The common features were an itchy cutaneous eruption, simultaneous spread to all the members of a family, and an original contact with grain. The offending mite is not specifically mentioned.

A. A.

Mendelson (Ralph W.). **An Exceptional Tropical Ulceration.**—*Jl. Trop. Med. & Hyg.* 1921. Dec. 15. Vol. 24. No. 24. p. 317. With 3 text figs.

This paper describes three cases with symptoms clinically similar, all in Europeans who had been at the seaside when they contracted the disease. In all the cases the ulcer had been found on the leg or foot, and had commenced as a slight abrasion, on which a nodule

developed later. This in a few days broke down, became painful, and the ulcer enlarged, and discharged purulent matter. In two of the three cases an identical mould, classed as " a monilia," was found.

E. G. G. L.

TOURNIER (E.). **Notes sur les ulcères phagédéniques des pays chauds et leur traitement.**—*Bull. Soc. Path. Exot.* 1921. Nov. 9. Vol. 14. No. 9. pp. 530–531.

Tournier emphasizes the fact that there are two varieties of tropical ulcer met with on the West African coast, one the true phagedenic ulcer, with Vincent's symbiosis (spirochaete and fusiform bacillus as its cause), and the other, much more frequently found, in which no spirochaetes are present, but only a polymorphic fine bacillus morphologically quite different from the fusiform bacillus. Clinically both types are characterized by the presence of a membranous ulceration, very resistant to treatment and tending to destroy large tracts of tissue, both superficial and deep. The first type, showing Vincent's symbiosis, is best treated with local applications of salvarsan, and is uninfluenced by atoxyl or antimony. The second type is eminently amenable to tartar emetic powder applied locally, and to a less degree to treatment by atoxyl. Local antiseptics are of little use in its treatment.

E. G. G. L.

APOSTOLIDES (Apost. G.). **Note on the Recent Epidemic of Tropical Septic Ulcer in Palestine (Tropical Sloughing Phagedaena).**—*Jl. Trop. Med. & Hyg.* 1922. Apr. 1. Vol. 25. No. 7. pp. 81–88.

Tropical ulcer seems not to have been noted in Palestine until 1919, when an epidemic described in this paper occurred, spread along the line of railway from Damascus by refugees from Mecca and Yemen. Bacteriological examinations showed the presence of Vincent's symbiosis, a spirochaete and a fusiform bacillus, in about 75 per cent. of the cases. While this is recognized as the effective cause of the condition, other circumstances are important adjuvants in the infection, such as ill health, poor nutrition, previous infection with syphilis and tubercle, and especially malaria. The coincidence of malaria is indeed so frequent that the author suggests that the mosquito is responsible for the transmission of both diseases.

The incubation period of tropical ulcer has been much disputed. The author quotes an example which allowed of establishing this very convincingly, a typical nodule being observed 48 hours after a direct inoculation. The most effective treatment in the author's experience is the intravenous injection of salvarsan, and the local application of 20 per cent. salvarsan ointment.

E. G. G. L.

VAN NITSEN (R.). **Le traitement de l'ulcère tropical.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1921. Dec. Vol. 1. No. 3. pp. 289–298.

Two stages of ulceration are considered : (1) the septic stage, when the ulcer is infected and extending in depth and extent. The following formula is favoured by the author—Iodoform, guaiacol, eucalyptol,

and Balsam of Peru aa. 10 gm.; alcohol, 100 gm.; sulphuric ether, to one litre. If this is found too costly, a 5 per cent. solution of Yadil is recommended. With careful treatment on these lines it is claimed that the septic period of ulceration may be reduced on an average to three days. (2) With the elimination of septic germs cicatrization begins, and this process is retarded by antiseptic applications. When the surface is free from infection, as demonstrated by bacteriological tests, the ulcer is excised, the wound kept under observation for one to four days, and if there is still no infection, which sometimes results from the operative interference, the edges are sutured, if the ulcer is not too large, or grafted if necessary. Statistics are quoted which show a very remarkable gain in time in the treatment of ulcers by this method as compared with ordinary procedures.

E. G. G. L.

Meo (Jean). **Au sujet du traitement de l'ulcère phagédénique.**—*Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1920. May. Vol. 2. No. 5. p. 130.

The author follows this procedure: (1) The ulcer is cleansed with a tampon soaked in tincture of iodine, or 1 per cent. solution of pot. permang. (2) It is dressed for three days with boiled water. (3) The cleaned ulcer is filled with powdered perborate of soda, renewed at first every two days, later every four days. Towards the 15th–18th day a dry dressing is applied. When syphilis is present (and 60 per cent. of the cases are associated with syphilis) specific treatment is added.

E. G. G. L.

Castueil. **Traitement de l'ulcère phagédénique des pays chauds par le perchlorure de fer.**—*Bull. Soc. Méd.-Chirurg. française de l'Ouest-Africain.* 1920. Feb. Vol. 2. No. 2. pp. 33–42.

The treatment here described consists in the application of a 20 per cent. solution of perchloride of iron, renewed daily at first, later every two days. In certain cases the administration of iodide of potassium hastens the cure.

E. G. G. L.

Mathur (Sarup Narain). **An Epidemic of So-Called Naga-Sore at Unao.**—*Indian Med. Gaz.* 1922. Mar. Vol. 57. No. 3. p. 96.

The author describes a series of cases of painful ulcer occurring in the rainy season in Unao. Smears from the ulcers showed the whole field to be full of "straight bacilli." [No further description is given.] The ulcers did well with dressings of copper sulphate lotion, gr. 4 to the ounce.

E. G. G. L.

van Nitsen (R.) & Mouchet (R.). **L'Onyxis ulcéreux phagédénique.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1921. Dec. Vol. 1. No. 3. pp. 287–288.

This condition has apparently received little attention in treatises on tropical disease, but is nevertheless common in the authors' experience. The ulceration may begin with any finger, extends round the nail, which is finally shed, and there may be ulcers in other parts of

the body as well. In 16 cases examined, 9 showed the combination of fusiform bacillus with Vincent's spirochaete; all showed the fusiform bacillus; and several showed mixed infections of staphylococcus, streptococcus and a diplococcus not named.

E. G. G. L.

Parounagian (Mihran B.) & Goodman (Herman). **Ulcerating Granuloma (Granuloma Inguinale): A Report of a Rare Example of this Disease in a Syphilitic Patient.**—*Arch. Dermat. & Syph.* 1922. May. Vol. 5. No. 5. pp. 597–601. With 4 text figs.

The patient was a native white American, who had never left New York city. The upper lip, side of the neck, groins, and perianal regions were occupied by a mass of hypertrophic, foul-smelling, discharging red papules and nodules. There was no glandular enlargement. The tongue showed symptoms of syphilis, and there was history of a penile sore six years previously. A Wassermann test made on the day of his admission under the authors was negative, but was strongly positive after an injection of silver arsphenamin. Donovan bodies were not found at this time, but some months later numerous extracellular and intracellular encapsulated short bacillary forms resembling Donovan bodies were found. The patient made little improvement with injections of silver arsphenamin (8 were given) and neoarsphenamin (3 injections). The patient was lost sight of before tartar emetic medication could be given.

E. G. G. L.

Iturbe (Juan) & Gonzalez (Eudoro). **Sobre un caso de granuloma venéreo proveniente de la Guayana británica y observado en Venezuela.** [Granuloma venereum in a Patient from British Guiana.]—*Contribución del Laboratorio Iturbe en el 3er Congresso Venezolano de Med.* 1921. pp. 23–28. With 1 plate.

The authors regard granuloma venereum as arising usually as a post-traumatic complication, after the operation of circumcision or the opening of a bubo, and bearing a close analogy with elephantiasis.

The patient was a negro of 27 years of age, who, two and a half years previously, had exhibited a subpreputial chancre diagnosed as syphilitic, but which, owing to its inaccessibility, had proved refractory to treatment. A small operation was undertaken to expose the sore and subsequent to this the condition of granuloma venereum developed. Medicinal treatment by mercury and neosalvarsan, surgical measures, such as scraping and cauterization, all proved unavailing. Wassermann and von Pirquet tests both yielded negative results. Microscopically, *Sp. refringens* was found, together with the "Donovan bodies." Treatment with tartar emetic was initiated and the author reports distinct improvement in the condition at the time of writing, when the patient had had 20 injections of Merck's 1 per cent. solution, starting with 0·01 gm. and increasing to three times this amount for the later doses.

H. Harold Scott.

Cange (A.) & Argaud (R.). **Les "Nodosités juxta-articulaires" syphilitiques.**—*Gaz. des Hôpit.* 1922. June 15. Vol. 95. No. 46. pp. 741–746.

Under this title is described an eruption of indolent fibrous nodules, varying in size from that of a pea to that of a duck's egg, situated

around the larger joints. Histologically the nodules occupy the subcutaneous cellular tissue. They are extremely chronic, and may last for years, or they may resolve or ulcerate. The geographical distribution of the affection is continually extending, and it can no longer be claimed as an exclusively tropical disease. A careful review of the literature is made, and the authors range themselves with the large and increasing body of opinion which regards these tumours as being of syphilitic origin. They insist on the superior value of mercurial treatment as compared with arsenical salts in dissipating the tumours.

E. G. G. L.

de Quervain (F.). [**Juxta-Articular Nodules.**] *Lyon Chirurg.* 1921. Sept.–Oct. Vol. 18. No. 5. p. 561. [Summarized in *Jl. Amer. Med. Assoc.* 1922. Jan. 21. Vol. 78. No. 3. p. 248.]

The author describes a case of this condition in a native of Switzerland, who had never left that country. The patient was a man of 55. One of the nodules was excised and proved to have the appearance of a syphilitic gumma.

E. G. G. L.

Mouchet (R.) & van Nitsen (R.). **Sur une dermatite verruqueuse des noirs de la Rhodésie du Nord-Est.**— *Ann. Soc. Belge de Méd. Trop.* Brussels. 1921. May. Vol. 1. No. 2. pp. 235–239. With 1 plate.

The paper describes a series of seven cases of a warty eruption in natives of North-East Rhodesia. In many of the cases the eruption of warty lesions dated from infancy. The distribution was chiefly on the limbs, upper and lower, and when they disappeared the lesions left scars. They were not itchy or painful or inflamed. The disease is well recognized by the natives, who give it a local name. The authors regard it as analogous to the "verrucose dermatitis" described by Lane and Medlar in 1915 as occurring in the United States, and also later by Pedroso and Gomez in Brazil. The authors were unable to demonstrate any fungus, and attempts at inoculation failed.

E. G. G. L.

Ghosh (Nishanath). **A Case of Leucoderma.**— *Indian Med. Gaz.* 1922. Mar. Vol. 57. No. 3. pp. 100–101.

The patient was an Indian landowner, aged 40, married in early life and remaining without issue, *i.e.*, exhibiting sterility. The pigmentary disorder had persisted for 10 years. The condition cleared up completely with some months of treatment with a pluriglandular tablet, hormotone.

E. G. G. L.

MISCELLANEOUS.

Mededeelingen van den Burgerlijken Geneeskundigen Dienst in Nederlandsch-Indië. 1920. Pt. 10. pp. 76–153. [In Dutch and English.] **Rapport over de influenza-epidemie in Nederlandsch-Indië 1918. Report on the Influenza Epidemic in Netherlands-India, 1918.**

This is the work of a Commission appointed in November, 1918, to investigate the nature of the disease influenza, its cause, epidemiology, mortality, and the preventive measures and treatment employed in the epidemic which visited the East Indian Archipelago in common with the rest of the world. A questionnaire sent to all the medical practitioners brought 83 replies; it is on these that the report is based.

Etiology.—The reporters evidently incline to the Pfeiffer bacillus, but conclude that nothing is positively known.

As to complications, 48 correspondents noted relapses, 63 pneumonia (apart from the febrile period), 45 haemorrhages (chiefly nasal, pulmonary or intestinal), 29 psychical symptoms, 24 premature delivery, 29 diarrhoea or dysentery. Tuberculosis and beriberi were noted fairly frequently.

Epidemiology.—The disease was first heard of in June on the East Coast of Sumatra. It rapidly extended from this and other foci in Sumatra and Java, till in August and September a great part of those islands and of Borneo was implicated. The east part of the Archipelago was at that time free. It was not till October that the Sunda Islands and Celebes were reached, and till November that the turn came of the Moluccas and New Guinea. The evidence shows that the disease was introduced from the Straits Settlements. In some islands the social life was seriously disturbed, *e.g.*, in Saparua (Amboina) "only 8 of the 800 inhabitants were able to do their work." In the November epidemic there was scarcely a town in the Dutch East Indies which was not attacked, and as before stated this was much the more serious. In the month of November the mortality curve for Java rose from about 25 in the previous month to 180 per 1,000. Another telling figure is the deaths in Java in November—402,163, as against 11,598 from cholera, smallpox and plague in the whole year!

A. G. B.

Briscoe (Cornelius D.). **Observations on Porto Rican Soldiers admitted to Ancon Hospital with Influenza during the Recent Epidemic.** —*Proc. Med. Assoc. Isthm. Canal Zone.* 1918. July–Dec. Vol. 11. Pt. 2. pp. 28–31.

The influenza epidemic was mild and does not call for remark.

The stools were examined in 249 cases and lateral spined schistosome ova were found in 11 [*S. haematobium* is evidently a lapsus for *S. mansoni*]. The curious point is that none of these patients had had any symptoms referable to schistosomiasis. The author has not been able to find anything of the kind in the literature.

A. G. B.

MALONE (R. H.). **A Bacteriological Investigation of Influenza. Part II. Carried out under the Indian Research Fund Association.**— *Indian Jl. Med. Res.* 1921. Oct. Vol. 9. No. 2. pp. 210–229.

The observations—expressed largely in tabular form—recorded in this paper refer to influenza in Bombay between July, 1919, and June, 1920, when the city had already, in 1918, undergone two epidemics. Diarrhoea and meningeal symptoms were very rare, the mortality was comparatively low (about 10 per cent.), and the disease was from the outset milder than in the earlier epidemics.

The predominating organisms in the sputum were Pfeiffer's bacillus, pneumococcus, and non-haemolytic streptococcus.

The *streptococcus* was equally evident in mild and severe cases, and also in healthy persons during and after the epidemic, and is therefore considered as more or less accidental.

Pfeiffer's bacillus occurred in 75 per cent. of 175 influenza specimens of sputum or pharyngeal secretion; in 83 per cent. of 41 out of 53 influenza cases in which the accessory respiratory sinuses were found, after death, to contain pus; as well as in 92 per cent. of 39 fatal cases in which bronchial tissue or lung tissue or pleural fluid was examined. On the other hand, the bacillus was demonstrated in only 18 per cent. of 138 specimens of pharyngeal secretion of healthy persons examined during the epidemic. The blood serum of influenza patients infected with the bacillus agglutinated the homologous strain in 77 per cent. out of 81 cases; the serum of 17 persons suffering from a variety of specific diseases and pathological conditions other than influenza did not agglutinate the bacillus—except in one of some cases of lobar pneumonia, and in one case of ankylostomiasis; nor was it agglutinated by the serum of healthy persons. Pfeiffer's bacillus is therefore considered to have had some direct connexion with this epidemic of influenza.

The *pneumococcus* was strikingly prevalent in severe cases and is considered to be a secondary invader and a potent cause of death. It was also noticed in healthy persons to be more often present during the epidemic than afterwards.

The author thinks that the failure to detect Pfeiffer's bacillus in some epidemics elsewhere may have been due to the use of unsuitable culture media.

A. Alcock.

VAN HOOF. **Valeur curative d'un vaccine contre la grippe.**— *Ann. Soc. Belge de Méd. Trop.* Brussels. 1921. May. Vol. 1. No. 2. pp. 255–258.

The vaccine employed was the "compound influenza vaccine C2" prepared at the South African Institute for Medical Research. It contains *M. catarrhalis*, *B. influenzae* and an 8-valent suspension of pneumococci. The absence of streptococcus is due to the observation that these organisms have never or very rarely been found in influenzal sputa in Tropical Africa; indeed, the streptococcus plays a very slight part in the local tropical pathology as compared with Europe. The vaccine was sensitized by BESREDKA's method and was successful in the treatment of 18 out of 25 cases, the details of which are not given.

A. G. B.

Treston (M. L.). **Four Years' Surgery in an Indian General Hospital in Mesopotamia.**—*Indian Med. Gaz.* 1921. Aug. Vol. 56. No. 8. pp. 283–294. With 2 text figs.

This paper is full of interesting detail, the author during four years having had 19,332 surgical cases under his care. [Here we must be content with a few points of wide general interest.] In Mesopotamia (as was long ago settled for India) chloroform is the right anaesthetic. Wounds from rifle and machine gun were always clean; wounds from other engines of war were almost without exception septic. For horrid septic wounds with fracture the author adds his testimony to the efficacy of the Carrel-Dakin treatment. Ghurkhas showed the most resisting power; Sikhs the least. Only five cases of gas-gangrene occurred, and two recovered; all were horrible bomb-wounds of the lower extremity; in all there was a long latent period (5–8 days or more); "one noticed in these patients the extraordinary mental alertness and the marked effect of the toxaemia on the cardiac muscle." Only one case of tetanus occurred in 1,412 cases, and here anti-tetanic serum (750 units) had been given. Every case must be judged by itself, but there should be no meddling with bullets in inaccessible places that appear to be doing no harm; even shrapnel bullets *can* be left, and there is a man now serving with his regiment, nearly four years afterwards, with one in his abdomen. In a man shot through the temple the bullet lodged inside his head some four and a half inches distant from the wound and seemed to cause no inconvenience. Ten cases were shots through the liver, and six through the spleen; all made an uneventful recovery except one man, shot through the liver, whose recovery was complicated by severe jaundice. In eye cases the eye was enucleated, leaving a frill of sclerotic round the optic nerve. Oriental sores occurred, principally during the cold season; various kinds of treatment were tried, and thorough scraping under chloroform followed by castor-oil dressing was found to give almost identical results with intravenous tartar emetic.

A A.

Vincens. **Notes sur le fonctionnement du service chirurgical à l'hôpital de Douala (Cameroun), novembre 1917 à novembre 1919.** —*Ann. de Méd. et de Pharm. Colon.* Paris. 1921. Apr.–May–June. Vol. 19. No. 2. pp. 192–200.

In the two years 1918-19, 556 operations were performed at the Duala hospital with 22 deaths. The readiness of the natives for operation is great; to ensure prompt admission to hospital a man with hernia will even simulate strangulation. Inguinal hernia is frequent. The author would attribute this to the frequency of congenital malformations and, secondly, to cough. Most are of the oblique variety. 261 radical cures were done, of which 150 were right, 76 were left hernias, and 35 double [*cf.* this *Bulletin*, Vol. 12, p. 136, and Vol. 14, p. 233. In Zanzibar and the Gold Coast the right side is affected even more frequently; the reason is unknown.] Bassini's operation was chosen. The mortality was 1·53 per cent. and there were three relapses. There were 16 radical cures of femoral hernia. Hernial strangulation is probably not infrequent but patients do not come till their condition is bad. Of 21 such operated on, eight died. All these operations were done under spinal analgesia.

Next to hernia come operations on the urethra and bladder, *e.g.*, old strictures previously "treated" by the medicine men. Thirteen internal urethrotomies, one external, and five suprapubic cystotomies were done. Elephantiasis is not very common, but 12 cases of scrotal elephantiasis were relieved by operation. Among diseases of women metritis with discharge of pus is common. After dilation of the cervix the womb is curetted and tinct. iodi or chloride of zinc applied. Among traumatisms, lacerated wounds occasioned by sword-fish are common; in the case of limbs, amputation or disarticulation is usually necessary. Details are given of the wounds produced by "human panthers." Phagedemic ulcer is very common and no treatment is so good as Vincent's powder, but antisyphilitic medication is generally required as well.

A. G. B.

Pennington (J. Rawson). **Surgery among Uncivilised Races.**—*Med. Record.* 1921. July 16. Vol. 100. No. 3. (Whole No. 2645.) pp. 89–95. With 7 text figs.

This is a very discursive article dealing not so much with any observed practices among savages tribes as with matters of miscellaneous interest, from the extensive mutilations resulting from gangrene decribed by Thurston, to the prehistoric trephining disclosed by ancient skulls.

A. A.

Bomstein. **Le traitement chirurgical de l'éléphantiasis du scrotum et de la verge.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1921. Dec. Vol. 1. No. 3. pp. 327–337. With 8 text figs.

An interesting paper which furnishes a record of successful surgical procedure carried out in the Belgian Congo under conditions difficult to realize by surgeons practising in civilized surroundings. The writer appears to have operated during a period of two years and eight months on more than 200 cases of elephantiasis of the scrotum and penis, with a mortality of only 1 per cent. In a few of the early cases he performed with his own hands the duties of general anaesthetist and of operating surgeon. He subsequently abandoned general for spinal anaesthesia and notes that a great saving of time was thereby effected. A 5 per cent. solution of stovaine was employed in doses of 1·5 cc. with no ill-effects beyond transient headache. Two cc. of the same solution occasionally produced nausea, yawning and malaise.

No details of the size and weight of the tumours removed are given, but judging from the low mortality and the figures portraying the different lines of incision advocated and practised it seems probable that some of the growths were small and the scrotal tissues not very extensively affected. To such a degree, however, was the operation popularized that it was, on occasion, carried out in native villages with the patient lying upon a mat in a tent and gossiping with his friends and acquaintances during its progress.

The writer advocates the use of the elastic tourniquet, rightly condemns the torsion of diseased and degenerate vessels as being certain to be followed by recurrent haemorrhage, and lays great stress upon rapidity of execution as the most important factor in obviating bleeding and ensuring good results. He details and illustrates many

lines of incision practised by himself and other surgeons. It is evident, however, that these must necessarily vary in individual cases with the amount of healthy skin available for the purpose of providing cover for the testes, and that consequently no set operation can be recommended for general adoption. The old adage that one must cut one's coat according to one's cloth is peculiarly applicable.

The writer in some of his cases experienced difficulty in liberating and isolating the penis, and regards this as being often the most delicate step in the operation, an experience contrary to that of the reviewer in Indian cases.

The paper, though neither adding appreciably to our knowledge of the subject of which it treats nor formulating any new line of surgical departure, is valuable as testifying to the marvellous field for surgical practice afforded by the tropics, and as recording in modest terms an instance of individual surgical effort and achievement under tropical conditions.

J. J. Pratt.

Sistrunk (W. E.). **The Kondoleon Operation for Elephantiasis: A Report of the End Results.**—*Southern Med. Jl.* 1921. Aug. Vol. 14. No. 8. pp. 619–625. With 4 text figs.

An earlier report on this subject was noticed in Vol. 13 (p. 37) of this *Bulletin*. The author has now operated on 31 cases of elephantiasis and 2 cases of lymph oedema. None was filarial. Every case of elephantiasis, he states, was preceded by lymph oedema, which in many instances was secondary to a mechanical blockage of the lymphatic or venous systems and in others apparently to a direct bacterial invasion of the tissues; in 15 instances the etiology was unknown.

Kondoleon's operation consists in the removal of a large extent of the skin, subcutaneous fat and deep aponeurosis from each side of the affected limb. The skin and a small amount of the cutaneous fat become adherent to the muscles and new lymphatic vessels are in time established. The technique is described with figures. The author concludes (1) that the Kondoleon operation controls the progress of elephantiasis; (2) the best results are obtained by previous treatment in bed for 2–3 weeks with elevation and firm bandaging of the limb; (3) a large amount of skin, fat and aponeurosis must be removed; (4) when patients are up and about the limb must be bandaged for an indefinite period and sometimes permanently after the operation; (5) the patient must previously be warned of this and that a perfectly normal limb is not to be expected; (6) second operations for the removal of hypertrophied skin are sometimes advisable.

The bibliography contains ten recent references.

The author writes from the Mayo Clinic, Rochester, U.S.A.

A. G. B.

de Magalhaes (P. S.). **As elephantiases e suas affinidades.** [The Elephantiases and Allied Disorders.]—27 pp. With 28 text figs. 1921. Rio de Janeiro: Imprensa Nacional.

A monograph on the elephantiases with a clinical history of a remarkable case in a woman now under the care of Professor Oscar Bulhoes in the Santa Casa da Misericordia of Rio. The illness commenced as long ago as 1886. The hyperplasia of the nates and

lower extremities is now so enormous that the patient is unable, night or day, to adopt any other than a sitting position and her weight is 133 kg., or just under 21 stone. An interesting account by Sir Patrick Manson of a case of congenital elephantiasis of the scalp in a negro under the care of the author of the present monograph is reproduced from the *American Journal of the Medical Sciences* of February, 1893. The monograph is enriched by 28 remarkable illustrations from different sources.

F. S. Arnold.

Breene (L. W.) & Linden (W. Zur). **Elephantiasis of the Scrotum.**—*U.S. Nav. Med. Bull.* 1921. Oct. Vol. 15. No. 4. p. 834. With 1 plate.

A brief account of a successful operation on a negro for a scrotal tumour estimated to weigh 50 lb.

A. G. B.

MacNaughton (J. G.). **Brief Note on a Case of Elephantiasis of the Vulva.**—*Jl. Trop. Med. & Hyg.* 1922. Mar. 1. Vol. 25. No. 5. p. 55. With 2 text figs.

No information beyond that conveyed by two photographs, which show a very large tumour in a patient from Tanganyika Territory.

A. G. B.

Lambert (Robert A.). **Post-War Medical Conditions among Armenian Refugees in Southern Turkey and Syria.** *Milit. Surgeon.* 1921. Sept. Vol. 49. No. 3. pp. 314–332. With 1 map and 4 illustrations.

The author was for a year or more Director, Aleppo District, of the Near East Relief. In 1915 a number of Armenians, variously estimated as half to one million persons, were driven into Mesopotamia and Syria. After the Armistice, those that had not perished were collected at Aleppo till they could be removed to their homes in the north. Not more than a quarter of a million could be accounted for. The refugees were poorly nourished, but examples of marked emaciation were exceptional; there were no cases of deficiency disease. Among the large disease groups eye infections were easily first; of cases seen in four months the great majority were trachoma and other forms of conjunctivitis, leucoma, staphyloma, pannus, entropion and corneal ulcers. The following extract is of interest:—

"The importance of hygienic conditions in the treatment, as well as the prevention, of trachoma, was well demonstrated in the comparison of two orphanages in Aleppo. One was a newly established institution, with its eight hundred children quartered in army tents, in a well-ordered camp, with large playgrounds, ample bathing facilities, no crowding, strict personal hygiene. The other, with 1,600 children, occupied dirty, poorly lighted stone buildings, [with] inadequate bathing facilities and much overcrowding. The class of children admitted was the same, and incidence of trachoma was approximately 60 per cent. in each. Identical methods of treatment at the two institutions under the supervision of American physicians and nurses gave very different results. Within three months a majority of the cases at the camp orphanage were dismissed cured, whereas at the other institution there were very few cures. Furthermore, at the latter a certain number of new cases had developed. Later experience showed that in institutions of the second type recurrences or reinfection were very common, making efforts at eradication quite fruitless so long as living conditions were not materially bettered."

Among skin diseases Aleppo button was prominent. After giving information on the disease familiar to readers of the *Bulletin*, the writer says that he "was impressed with the striking differences between the disease seen in Aleppo, as regards gross features of the lesions, their distribution on the body and the clinical course, and the American form of the disease, which he had an opportunity of studying several years ago in the Amazon Valley." The application of aniline dyes, and that of mud practised by the natives, are believed to owe their efficacy to the exclusion of light.

In spite of the scarcity of water, malaria was the commonest of the infectious diseases, the long rainless period necessitating the use of cisterns. Other tropical fevers were sandfly and relapsing fevers, Notwithstanding the great prevalence of body lice and the crowded conditions of living, only sporadic cases of typhus were seen. Few cases of typhoid or dysentery and none of cholera were met with, though personal uncleanness, abundance of flies, unprotected food, contaminated water supplies, seemed to invite the attack of these diseases. The author cannot offer a satisfactory explanation.

Pulmonary and bone tuberculosis were widespread and have undoubtedly been increased by war conditions, and venereal diseases have increased exceedingly. The leper appears to have been wiped out by the war.

A. G. B.

Müller (L. R.). **Ueber die Krankheiten des Orients.** [Diseases of the East.]—*Muench. Med. Woch.* 1921. July 22. Vol. 68. No. 29. pp. 905–907.

A sketch of disease conditions in Asia Minor; the author seems to have got most of his experience in Constantinople. He begins by calling attention to the rarity of some European diseases. Cancerous tumours of the internal organs are seldom seen, whereas those of the skin, and especially the face, are commoner than in Europe. Tabes and general paralysis are rare; the general paralytics in the Turkish asylums make up only 0·6 per cent. of the inmates, whereas in Europe the figure exceeds 10. Tuberculosis is very common among the poor; in Constantinople one-third of the cases in the surgical clinic are bone, joint or gland tuberculosis, and in the medical wards tuberculosis heads the list of diseases treated. Contracted kidney and high arterial tension are rare.

Coming to diseases of the East, he finds that intestinal affections are extremely common. All newcomers to Constantinople get the "Maladie de Bosphore," a feverish intestinal catarrh, which is usually believed to be a form of paratyphoid. Bacillary dysentery is frequent, amoebic less common at Constantinople than in the warmer lands to the south. Pappataci fever and dengue, attributed to *C. fatigans*, are common. Typhus and relapsing fever, he remarks, are not characteristic diseases of the East, except in time of war. For relapsing fever infection greater infestation with lice is necessary than for typhus. In $1\frac{1}{4}$ years at a large hospital in Constantinople the author saw one case only of undulant fever. He does not tell us anything fresh or precise about malaria, but recognizes its wide prevalence. Bilharzia infections were not seen. [See also von Düring, who has much to say about syphilis in Asia Minor, this *Bulletin*, Vol. 15, p. 281.]

A. G. B.

Schilling (Viktor). **Kriegshygienische Erfahrungen in der Türkei (Cilicien, Nordsyrien).** [Experiences of War Hygiene in Turkey (Cilicia, North Syria).]—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1921. Vol. 25. Beiheft 3. pp. 5–41. With 2 figs. and 4 plates.

The author was stationed at Aleppo, as adviser in hygiene on the lines of communication, from spring, 1916, to autumn, 1917, and visited Palestine on similar duties, as well as Constantinople, Smyrna and the interior of Asia Minor. He here gives an interesting account of the diseases and hygienic conditions met with, the result of his own experience, and that of numerous German and Turkish doctors.

The chief seat of *malaria* was not the coastal plain but the hills, where the Anopheles could be reached with difficulty. This led at first to failure to recognize the nature of the fever seen at high levels.

Typhus was the second great plague. The author had the impression that the delousing of the sick, inefficient though it was, rapidly checked the epidemic, although lice were still present, and he compares the suppression of yellow fever by the eradication of house mosquitoes and isolation of the patient. The almost complete disappearance of typhus in the summer months is similarly explained, in that the lice do not easily travel from man to man and the opportunities for washing reduce their numbers.

Relapsing fever was common among the Turks, but rare among the Germans. This the author explains by the fact of the transmission by louse excreta in scratching, which would more readily occur among the heavily infested Turks than the lightly infested Europeans. On the other hand, the Germans suffered heavily from typhus, which may be conveyed by a single louse bite.

Pappataci fever was little noticed among the natives, but very prevalent among travelling Turks and Germans. Its connexion with Phlebotomus was evident.

Dengue occurred in a small epidemic with joint pains and a typical saddle-back curve; Stegomyia were very numerous.

Cholera was introduced twice from the north. The author formed a high opinion of preventive inoculation, though he is unable to give figures. It should be repeated every two months, or oftener in case of exposure.

Dysentery was seen in about equal shares of bacillary and amoebic; the severest amoebic cases came from Baghdad and Damascus. Liver abscess was of rare occurrence.

Undulant fever was seen in Jerusalem and Smyrna.

Though in 1862, according to Hirsch, few Europeans at Aleppo escaped an attack of *Aleppo boil*, the author found it uncommon and chiefly among native children in the dirtiest quarter. Germans became infected in Baghdad, and, infrequently, in Diarbekir and Mardin. These facts, the author says, are in favour of a mode of spread which disappeared with the draining of a marshy hollow in Aleppo itself, and are against the Phlebotomus theory, for these flies were to be found in large numbers.

Kala azar was not seen, though many suspicious cases were punctured, but it has been diagnosed at Hamburg in a man who apparently contracted it in the Amanus range; it is known to occur in Baghdad [see Külz, this *Bulletin*, Vol. 15, p. 281].

The rest of the paper concerns the difficulties with which the author and his colleagues were faced, not all of which seem to have been unavoidable, and he lays down a series of recommendation for future campaigns in warm countries. A list of 81 references to papers on disease conditions in the Near East is appended.

A. G. B.

Detzner (Hermann). **Medizinische und hygienische Streiflichter aus dem Innern von Neuguinea.** [Sidelights on Medicine and Hygiene from the Interior of New Guinea.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1921. Vol. 25. No. 3. pp. 67–79.

This is a discursive article. The author expresses a fervent hope for the return of the time when New Guinea will again become the goal of a German administration, German physicians, and German planters and missionaries.

A. A.

Crichlow (Nathaniel). **The Climate and Health of the British Solomon Islands.**—*Jl. Trop. Med. & Hyg.* 1921. Oct. 15. Vol. 24. No. 24. pp. 268–269.

An article apparently intended for the layman. Malaria and dysentery (type not stated) are prevalent, but smallpox and typhoid fever are as yet unknown in these fortunate islands.

A. G. B.

Hollenbeck (Henry S.). **Some Observations on the Medical Situation in West, Central and South Africa.**—*Jl. Trop. Med. & Hyg.* 1921. Dec. 1. Vol. 24. No. 23. pp. 304–305.

The author was a member of the Phelps-Stokes Commission* sent to make a survey of conditions affecting the education and general welfare of the natives in Africa, which in the course of a year visited British West Africa, Liberia, Cameroon, Belgian Congo, Portuguese West and South Africa. His task was to observe the sanitary and hygienic conditions, and he reports the results in this paper. With most of the points he makes those who know even a part of his vast field will heartily concur.

He notes the utter inadequacy of the medical force, both from the point of view of numbers and equipment, for the work that urgently needs to be done, but realizes that both Missions and Governments are at present hard put to it to obtain medical officers. There is similarly a dearth of trained native assistants. Facilities are lacking for training a native medical force capable of dealing with the local diseases. There is no school for such training and no general effort in this direction. [In this respect Britain is much behind France, none of whose colonies was visited.] This is a field on which Missions and Governments could co-operate. He notes the very high death-rate from preventable diseases, which is quite general, and the uncertainty—apart from sleeping sickness—whether the population of various places is not

* The Phelps-Stokes Fund in America has undertaken the task of surveying the educational work of missions and philanthropic bodies in America and elsewhere.

falling. He considers that malaria is the chief causative factor and in all the tropical colonies accounts for a large part of the excessively high infantile mortality. He points to the frequent failure of anti-mosquito measures. He cites the high percentage of hookworm infestation. He then comes to the proper care of infants, and notes [justly] that the very low vitality of some native peoples is probably due in part to faulty diet. The popular food in many cases does not fulfil the requirements of a complete diet. An instance is given from the Johannesburg mines, where a partial crop failure in a district whence natives were drawn led under strain to scurvy. An effort should be made to introduce more variety of food products and improved methods of cultivation. Sleeping sickness in the Congo is far from being under control; a much larger medical staff is required. Finally, among his conclusions, he states: — "More attention should be given to the teaching of hygiene and sanitation in the schools."

[Dr. Hollenbeck has in plain language pointed out wherein we have failed to reach a reasonably high standard in the application of hygiene in Tropical Africa, and it is to be hoped that his remarks will be widely read. Is, however, malaria the leading causative factor in Tropical Africa in the mortality both of adult natives and children? This statement is frequently made, but rests on no foundation of carefully recorded cases. The reviewer believes that we know very little of the causes of death in African natives, and that till the subject has been adequately studied any efforts we make to reduce the death-rate are likely to be ill-directed and ineffective. On the subject of hookworm Dr. Hollenbeck is vague, merely noting that the proportion of infection is frequently noted as 80–90 per cent. Except where it is proved otherwise, has hookworm infestation in Africans any more significance than infestation by other members of the numerous intestinal fauna?]

A. G. B.

Lenz (Wilhelm). **Phylogene Neurasthenie beim ostafrikanischen Eingeborenen.**— *Arch. f. Schiffs- u. Trop.-Hyg.* 1921. Vol. 25. No. 9. pp. 271–278.

We have here an entertaining account of the psychology of the African negro as illustrated in his everyday behaviour. According to the author the negro, by the action, through generation after generation, of a tropical climate, has become by nature and by nurture—or, as he puts it, "phyletically and ontogenetically"—a neurasthenic. The weak point of the negro is not lack of intelligence, not want of endurance, or even of a mechanical sort of diligence, but infirmity of purpose, mental sluggishness, want of energy and resolution. Behind this slackness of will must be some corporeal, some chemical defect, perhaps a deficiency of some hormon. The author thinks that the tropical sun has put a beneficial brake upon the mental energy of the African, and in compensation has endowed him with "the inexhaustible joy of life that fills the little black folk."

The author is of opinion that his conclusions are probably applicable to the inhabitants of all tropical countries, and that even the European by long residence in the tropics becomes something like the negro (dem Neger angenähert).

A. A.

i. Méo. **Discussion des indices de robusticité chez les noirs.**—*Presse Méd.* 1921. Sept. 21. No. 76. pp. 1369–1370.

ii. Heckel (Francis). **A propos de la densité humaine et de l'indice de robusticité chez les blancs et les noirs.**—*Ibid.* Dec. 31. No. 105. pp. 1907–1909.

i. The author, to whom it fell to recruit black troops in the French West African Colonies in 1914, found that the formula of Pignet (height in centimetres — (chest measurement at greatest expansion in cms. + weight in kilos)) gave inaccurate results, which he attributed to the lesser density of the negro as compared with the white ; the difference varied between 5 and 10 points. He tested another index described by Koby, which he found unsatisfactory, and devised one of his own, in which the sum of the circumferences of the arm, thigh, calf and chest is subtracted from the height + waist measurement. Figures varying from 15–25 (excellent) to 50–55 (passable) were thus obtained in 4,000 examinations. In this formula less preponderance is given to the weight and more to the muscular and respiratory development.

ii. Heckel points out that the strength of a man does not depend on his configuration, that such formulae are valueless when applied to professional or natural athletes, as the negroes are in their own country, that since the war, and even before, we know that persons of mediocre appearance may be endowed with excellent physical qualities, that indexes of " robusticité " must be established by tests of action rather than by measurements, and that in any case negroes normally developed and without fat cannot be compared with whites less muscular and having subcutaneous as well as visceral and muscular fat, unless champions be selected for the comparison. He gives a list of champions with their heights and weights, and concludes that white athletes have the same weight and volume for the same height, and thus the same density as the negroes. Incidentally, he shows the absurdity of the rule accepted by Méo that the weight of a healthy man in kilos should equal or exceed his height in centimetres above a metre.

A. G. B.

Neves (José da Silva). **Distrito Militar do Congo. Relatório do ano de 1919.**—*Rev. Méd. de Angola.* Loanda. 1921. Aug. No. 1. pp. 167–180.

The report is devoted in the main to pointing out the serious insufficiency of the medical service in the Congo district of Portuguese West Africa. The distances are enormous, the difficulties of travel extreme, and the supply of medical officers and hospitals entirely inadequate to deal with the amount of disease prevalent among both Europeans and natives.

F. S. Arnold.

Archives des Instituts Pasteur de L'Afrique du Nord. 1921. July. Vol. 1. No. 2. pp. 201 213. **Fonctionnement des Services de l'Institut Pasteur de Tunis pendant l'année 1920.**

In 1920 the Pasteur Institute of Tunis was transferred from the control of the Department of Agriculture, with which it had been associated since 1894, to the Secretariat of the Tunisian Government.

The number of persons treated for rabies was 780, a figure lower than that of 1919, but characterized by the author as *honteux*, witnessing to the mal-application of the laws and the indifference of dog owners.

The 10,800 analyses made during the year are classified.

The report bears the initials of the Director, Dr. Ch. NICOLLE.

A. G. B.

COLONY AND PROTECTORATE OF KENYA. **Annual Report for the Year 1920, Bacteriological Laboratory.** [CLEARKIN (P. A.), Act. Senior Bacteriologist.]—15 pp.

The writer of this report, who took up his duties, on appointment, in May, writes that the year was spent entirely on routine, the examinations numbering nearly 11,000 and the duties including the preparation of calf lymph. There is consequently not much of general interest. In an outbreak of plague which occurred at Nairobi towards the end of the year, of 6,551 rats examined 11 only were positive, and these were all from infected houses; the remaining rats were caught by the health authorities and were all negative. Of malaria it is recorded that whereas in 1918, the last year of war, the ratio of benign tertian to subtertian cases was 1 : 1·4, in 1919 it was 1 : 6, and in 1920 1 : 5 (44 and 223). "It would thus appear that the type of malaria in Nairobi changed during the war and that now we have returned to our native type." Of 195 samples of faeces in which helminth ova were found, 35 per cent. showed *Ancylostoma duodenale*, 22 per cent. *Taenia solium*, and 6·6 per cent. Schistosoma.

A. G. B.

SOUTH AFRICA. **The South African Institute for Medical Research. Annual Report for the Year ended 31st December, 1920.** [WATKINS-PITCHFORD (Wilfred), M.D. (Lond.), F.R.C.S. (Eng.), D.P.H. (Oxon), Director.]—1921. Johannesburg: Hortors Ltd., Printers. 46 pp. With 3 illustrations.

This Report contains much that is of interest. The Routine Division, as in the preceding year, made a profit, in this case £3,238, which was transferred to the Research Division.

Research Division.—The meningococcus was isolated from 77 cases of cerebrospinal fever and the pneumococcus from 14. Of 69 strains of meningococci examined 50 belonged to Gordon's Type I. All but one case occurred in native labourers on the Rand gold mines and the great majority in Portuguese East Africans.

The appearance of most of the lungs of 40 cases of pulmonary infection in natives suggested influenzal broncho-pneumonia rather than lobar pneumonia, and *B. influenzae* was found in a considerable number, here again chiefly in Portuguese Africans. A satisfactory method of preserving the viability of pneumococci in cultures was devised: it consists in growth in defibrinated rabbit's blood, and desiccation in a vacuum.

After remarks on plague, silicosis, typhus and tuberculosis, the report comes to bilharzial disease. *Physopsis africana* has been demonstrated to be receptive to both *B. haematobia* and *B. mansoni*, but a more susceptible host for the latter is *Planorbis pfeifferi*; it has, however, to be remembered that Physopsis is the more common.

Routine Division.—A large fall in the number of examinations for malaria and of rats for plague was more than compensated by increases in other directions. In 193 examinations of faeces for dysentery

there were 64 positives; *E. histolytica* was found in 60 specimens and in the other four Morgan's bacillus or Flexner-Y.

Though 257 of 1,051 specimens examined for enteric by Widal were positive, "a considerable number of cases which clinically are undoubtedly enteric are not giving positive results by agglutination tests." Possible reasons for this are considered and it is attributed to late or non-development of agglutinins in otherwise typical enteric fever. A case in point is described in which *B. typhosus* was isolated from the urine, but the serum gave negative agglutination tests right through. The Institute urges the local profession to take blood-cultures in the first week of the disease.

Plague made its appearance in the Union in the north-western portion of the Orange Free State. Naturally infected specimens of gerbils and multimammate mice have been received from the endemic area. Of 59 agglutination tests (Weil-Felix reaction) for typhus, only 18 gave positive results, though as many again were clinically cases of that disease. At Johannesburg the test has not proved so reliable for diagnosis as in Europe and Asia. The strain of *B. proteus* X 19 employed came from the Lister Institute. Possible reasons are discussed.

Under General Histology it is noted that 13 specimens of primary liver carcinoma in natives were seen during the year, though the condition is stated to be very rare.

A Research Fellow has been appointed to study the vitamin content of the diet of native mine-labourers.

A. G. B.

Assam. **King Edward VII Memorial Pasteur Institute, Shillong. The Fourth Annual Report for the Year ending 31st December, 1920.** [Horne (J. R.), I.M.S., Director, and Fox (E. C. R.), I.M.D., Assistant to the Director.]—29 pp. 1921. Shillong: Printed by the Government Press, Assam. [Price 12 annas.]

Major Knowles vacated the Directorship in February, 1920, and till December 7 Mr. E. C. R. Fox, I.M.D., officiated as Director. The total number of cases completing the Pasteur treatment was 1,626, of which 1,542 were Indians and 84 Europeans. This is an increase of 15 per cent. on the preceding year. The various statistical details are exhibited in 18 tables. Jackals formed 24 per cent. of the biting animals and were responsible for no less than 28 per cent. of the total cases. The hydrophobia rate for their bites was 2·4 per cent. as against 0·79 for dog bites.

For kala azar 54 patients were treated. During the four years 1917–20, of 140 cases arriving for tartar emetic treatment 94 were cured, 32 died, and 14 left before treatment was completed. There was no epidemic of diphtheria in this year. The persistent occurrence of cases of enteric fever at Shillong between March and October is described as disquieting. The Institute realized by the sale of vaccines the sum of Rs. 35,027.

A. G. B.

Wallace (A. F.). **Splenic Abscess.**—*Med. Jl. S. Africa.* 1922. Mar. Vol. 17. No. 8. pp. 155–157.

In two years at Broken Hill, Northern Rhodesia, the author has seen no less than 49 cases of splenic abscess in natives—19 at operation,

and the rest in the mortuary. In the ten years before he saw no such cases. The illness begins suddenly with high temperature, headache and general pains. After two or three days the patient feels better and complains of pain in the splenic region; the spleen is found to be enlarged and tender. Commonly it ruptures; if not, it continues to enlarge and becomes tympanitic. In some spleens post mortem there is the similitude of multiple infarction; in others the whole organ is affected. The author, under local anaesthesia, cuts down boldly on the spleen, which is invariably adherent to the abdominal wall, and inserts a drainage tube; in one instance eight pints of pus were let out. Cases have occurred in other parts of Northern Rhodesia. Of his 49, 3 were women, the rest adult males. The causation is obscure. "It seems to commence with an attack of influenza." In a pus specimen sent to the South African Institute for Medical Research spirochaetes were found and tick fever was suggested, but study of eight subsequent cases failed to establish this hypothesis. A specimen of blood serum sent to the same Institute agglutinated *B. paratyphosus* C; five later cases failed to do so and no record can be found of splenic abscess in this infection. A spore-bearing bacillus, presumably gas-forming, was also found. The tests for enteric, typhus, undulant fever, syphilis, were all negative. Amoebae could not be found in the pus. In the same period ten cases of cerebral thrombosis have been seen in natives, and in three of these the spleen was affected. The author suggests that the development of splenic abscess was prevented by death.

A. G. B.

Stanton (A. T.) & Fletcher (William). **Melioidosis, a New Disease of the Tropics.**—*Studies from the Inst. for Med. Res., Federated Malay States.* 1921. Kuala Lumpur: F.M.S. Govt. Printing Office. 2 pp.

The authors in this short note tell us that they have identified the glanders-like disease first described by Whitmore in Rangoon in 1912 [see this *Bulletin*, Vol. 1, p. 588; Vol. 2, p. 107] as present also in the Federated Malay States. They have published three communications on the subject which have not reached the Bureau; the substance of these is therefore reproduced from the present note.

"Fletcher in 1914 studied an outbreak of a septicaemic disease among laboratory animals, identified the causative agent, and showed that the disease was conveyed through contamination of food. Stanton (1917) in a study with P. H. Hennessy of outbreaks of a disease resembling Asiatic cholera, observed that patients who recovered from the initial attack might die later from a form of septicaemia, with lesions of the lungs and other viscera resembling those of miliary tuberculosis. Stanton identified the causative agent of this disease, first in the lesions at post-mortem examination, and later in the blood, urine, sputum, and in the fluid from cutaneous vesicles, of clinical cases. By feeding and by inoculation of pure cultures of the micro-organism, he reproduced identical lesions in a number of different animals—guinea-pig, rabbit, white mouse, rat, monkey, sheep and goat. He showed that the infecting agent was excreted in the faeces and urine of these animals. Stanton (1918) also observed several cases of natural infection in animals, one case in a domestic cat that had died of 'haemorrhagic distemper.' He suggested on epidemiological grounds that the infection might be a natural disease of rodents, and that infection is conveyed to man by contamination of food-stuffs by the excreta of these animals. Fletcher (1919) compared the micro-organisms isolated by Stanton and himself and established their identity."

Recently they have seen two further cases, one of chronic infection with lesions confined to the skin and subcutaneous tissues, and a fatal case with extensive abscess formation in the liver, lungs and spleen. The blood serum of the first case agglutinated the specific micro-organism in high titre (1–2,500 to 1-3,000), thus completing the proof of its causal relationship to the disease. It is concluded that the condition described by Whitmore in Rangoon and by the authors in Malaya is one and the same disease, for which the name Melioidosis is proposed, "Melis" being a Greek term for a variety of conditions resembling glanders. The causative agent they name *Bacterium whitmori*.

A. G. B.

Cornwall (J. W.) & Lafrenais (H. M.). **Bacilluria: Another Unnamed Organism.**— *Indian Med. Gaz.* 1921. Sept. Vol. 56. No. 9. pp. 325–326.

This paper is from the Pasteur Institute of Southern India, Coonoor. The patient, a European, about 50, stated that he had been under treatment for paratyphoid A fever in Calcutta for three months, that his urine had been infected with *B. coli*, and that a vaccine had been injected. "Numerous short, fat, sluggishly motile bacteria, single and in short filaments" were found in the urine. A pure culture was readily obtained; the characters are given.

"The organism is evidently not *B. coli communis*. It was strongly agglutinated by the patient's own serum, over 1 in 1,400, but not by typhoid or paratyphoid A or B serum. The patient's serum did not agglutinate *B. typhosus*, para A or B. The organism differs from the group containing *B. suipestifer*, *B. enteridis* and paratyphoid B in forming indol and fermenting salicin, and from the group containing *B. coli communis*, *B. neapolitanus*, and *B. acidi lactici* in failing to ferment lactose."

The authors consider that the diagnosis of *B. coli* in the urine was made on insufficient grounds; further, that the original illness was possibly due to infection with the bacillus now described and not to paratyphoid A.

They point out that when a urine is found to be swarming with bacilli it does not follow that they are either *B. coli communis* or belong to the typhoid group.

A. G. B

Mutermilch (S.). [**Abstract** (in *Bull. Inst. Pasteur.* 1921. Dec. 15. Vol. 19. No. 23. pp. 854–859.) **on Certain Ultra-microscopic Filterable Viruses having a Selective Affinity for Tissues of Ectodermal Origin.**]

This is an abstract of a number of papers, many of them by Levaditi and his collaborators, on a group of "ultra-viruses" (filterable viruses) having an affinity (as Levaditi concludes) for tissues derived from the ectoderm (epithelium and nerve-tissue) and responsible for a group of infective diseases, termed by him ectodermoses. Examples of these ectodermoses are epidemic encephalitis, herpes, cow-pox, rabies, polyomyelitis, and perhaps (as Netter believes) mumps. These ectodermoses, while having a generic affinity for all tissues of ectodermal origin, are some of them more specifically attracted to nerve-tissue, and others of them to epithelial tissue; the former, of which encephalitis is an example, are termed neurotropic, the latter.

of which cow-pox is an example, are termed epitheliotropic; but a neurotropic virus can be adaptively epitheliotropic and vice versa.

These speculations have an experimental basis, which may be summarized very briefly as follows.

1. There exist several filterable viruses that show affinities with that specifically known as the virus of epidemic encephalitis. First, there is the *salivary virus*, which exists in the saliva of healthy subjects. This, when inoculated into the cornea of the rabbit may either be innocuous, or may provoke a kerato-conjunctivitis of varying degrees of virulence comparable to that caused by inoculation with the virus of herpes labialis or that of encephalitis; in one such case the animal died with symptoms of encephalitis. This salivary virus does not originate from cultivable microbes, or from salivary spirochaetes, nor yet from the pure salivary secretion drawn by catheter; it exists only in the mixed saliva from the mouth, and appears to be traceable to the epithelium of the mouth.

2. Then there is the *keratitogenous and encephalitogenous salivary virus* found in some healthy subjects, but particularly in the saliva of a healthy subject who had been frequently in contact with encephalitics. This differs from the preceding only in virulence. When inoculated into the rabbit, either by corneal or by cerebral route, it causes a fatal encephalitis.

3. Thirdly, there is the *keratitogenous and encephalitogenous herpetic virus*, discovered in herpes of the cornea by Grüter and in herpes labialis by Löwenstein and by Doerr and Vöchting, and shown by Levaditi to be capable of provoking a fatal encephalitis when injected into the rabbit's cornea.

4. Finally, there is the specific *keratitogenous and encephalitogenous virus* that exists in the naso-pharyngeal secretions and brain in cases of epidemic encephalitis.

From this series of filterable viruses we get the concept of a neurotropic virus becoming adaptively epitheliotropic, and the concept is avouched by cross immunity experiments on rabbits, for although vaccination by the ordinary salivary virus (No. 1) has conferred immunity against the other three viruses in only two experiments, in vaccination by the other three viruses reciprocal immunity is conferred in each case.

Converse experimentation shows that an epitheliotropic virus can accommodate itself to neurotropism, Levaditi and his collaborators having proved that fresh vaccinia virus after being passed a great many times through rabbits' brain (where, as Marie had previously observed, it engendered a rapidly mortal malady) was still able, when inoculated from the brain into the skin, to produce a good eruption of vaccinia.

The virus of encephalitis can pass from the mother to the foetus in the rabbit, and also in the human female.

In eight experiments Levaditi, Harvier, and Nicolau, have not been able to confirm the observation of Netter, Césari, and Durand, that the encephalitic virus inoculated by the cerebral route into rabbits can be found in the animals' salivary glands.

The subtle and pervasive suggestiveness of the above observations and speculations justifies a brief notice of a subject that otherwise lies outside the scope of this *Bulletin*. References to original papers—some of which have been consulted by the reviewer—will be found appended to Mutermilch's abstract.

A. A.

Woodcock (H. M.). **An Introduction to the Study of Haematophagy.** —*Jl. Roy. Army Med. Corps.* 1921. Nov. & Dec. Vol. 37. Nos. 5 & 6. pp. 321–341, & 418–431. With 2 text figs. and 7 plates.

Haematophagy is the business which may be carried on by a cell of ingesting blood cells, and is to be distinguished by name at least from phagocytosis. The author's object is to draw attention to some of the phenomena of haematophagy as seen by him in different kinds of cells.

He begins with the "haematophagy" commonly included in the term phagocytosis, namely the ingestion of red blood corpuscles by the macrophages (certain large uninuclears and the endothelial megacaryocytes). In this kind of haematophagy the haemoglobin of the ingested reds is completely assimilated by the macrophages, not rejected as pigment. As a result of this kind of haematophagy the macrophage grows, and proliferates in the form of blood platelets. The author points out that Wright in 1906 and Downey in 1913 had ascribed the origin of blood platelets to megacaryocytes, but that they had missed the important fact that these cells digest and assimilate red blood corpuscles.

"Haematophagy" of an incomplete and not quite normal kind is detected by the author in the lymphocytes of the guinea-pig. These particular lymphocytes have a predilection for red cells, and ingest them, but they cannot completely digest them, and they remain as Kurloff bodies with the haemaglobin altered indeed but not assimilated.

This imperfect haematophagy suggests to the author a primitive kind of behaviour, a sort of primal instinct, inherent in the unicellular animal, but latent in the differentiated tissue cells of metazoa, for feeding on solid food. Though latent, this inclination may be aroused by unconventional stimuli. Under some such subtle stimulus provided by the virus of hydrophobia certain nerve cells may become haematophagic, and the author detects the results of this abnormal behaviour in the Negri bodies, which he regards as fundamentally similar to Kurloff bodies. Nerve cells may also be goaded to haematophagy by stimuli originating in viper venom, or in emulsion of *Bacillus pyocyaneus*. Other cells of ectodermal derivation may be exasperated to haematophagy by other kinds of virus, and the author has no doubt that the Guarnieri bodies in small-pox infection represent the results of haematophagy by epithelial cells. The author has a similar explanation for Prowazek's bodies and Mallory's bodies, and, in short, for the entire Chlamydozoon concept. Finally, the Rickettsia enigma may be resolved into "platelet-granules"—a by-product of the digestion of blood cells by endothelial cells of the vascular tissue, apparently a sort of reflexion of the process of blood-platelet formation by macrophages not distracted by any peculiar stimulus.

We have now reached the limits of the author's speculation, and are brought to the conclusion that haematophagy by tissue cells perverted by abnormal stimuli is a great pathogenetic phenomenon, of which Negri bodies and their like are the obvious physical signs.

As to the nature of the stimulus, the author suggests a verbal explanation of a minute quantity of ferment specific for each disease starting the haematophagy in each particular kind of cell. Once the haematophagy is started more and more of the ferment is produced—*Crescit indulgens sibi dirus hydrops.*

Besides the hypothetical ferment, there are further to be considered the hypothetical waste or excretory substances of the haematophagous cells—these, or the further products of their decomposition, may be toxic and may contribute to the pathological effect of the particular disease.

[The author's speculations are certainly interesting, even stimulating, and there is nothing unreasonable about them as speculations. The ingestion of solid bodies by metazoon tissue-cells is a verifiable phenomenon, not unfamiliar, and some varied experimental work in this direction would be a good deal more convincing than the evidence —which cannot but be affected by the personal equation —of stained films. The origins of big things lie too deep to be revealed to simple inspection in one field, and it is good in these days of hustle to remember the way that the greatest of natural philosophers of the Victorian age went to work :—

" When on board H.M.S. ' Beagle ' as naturalist I was much struck with certain facts. . . . These facts seemed to throw some light on the origin of species. . . . On my return home it occurred to me in 1837 that something might perhaps be made out on this question by patiently accumulating and reflecting on all sorts of facts which could possibly have any bearing on it. After five years' work, I allowed myself to speculate on the subject, and drew up some short notes ; these I enlarged in 1844 into a sketch of the conclusions, which then seemed to me probable : from that period to the present day (1859) I have steadily pursued the same object. I hope that I may be excused for entering on these personal details, as I give them to show that I have not been hasty in coming to a decision."—Darwin : Origin of Species, Introduction.]

A. A

REVIEWS AND NOTICES.

PHISALIX (Marie). **Animaux venimeux et venins : la fonction venimeuse chez tous les animaux ; les appareils venimeux, les venins et leurs propriétés ; les fonctions et usages des venins ; l'envenimation et son traitement.** (In 2 Vols.) Vol. 1. pp. xxv + 656. With 232 figs. and 4 plates. Vol. 2. pp. xiii + 864. With 289 figs. and 13 plates. 1922. Paris : Masson & Cie., 120, Boulevard, Saint-Germain. [Price 120 fr. net.]

The name of Phisalix is so well established among all who are interested in the subject of animal venoms that this monumental work by the widow of a distinguished pair of life-long collaborators of that name is assured of a cordial and respectful welcome, apart from its singular merits as—in the words of the lamented LAVERAN, who has graced it with an appropriate introduction—the most comprehensive and complete volume existing in any language on the science of animal venoms. Here, indeed, we find collected and compiled in upwards of 1,550 pages all the known facts about venomous animals, the term venomous being used in a very wide sense to include, at the one extreme, toxins like those of the pathogenic Protozoa, of which the existence is inferred rather than demonstrated, and, at the other extreme, tangible venoms like those of snakes, which have been both the subject of erudite study and the object of vulgar astonishment.

In the presentation of the subject each zoological phylum, or group of associated phyla, is independently treated in brief historical and zoological perspective, in appropriate anatomical detail, in the physiological, biochemical, and pathological aspects of its specific venoms, and in congruent bibliographical narrative. The outlook of the work is thus almost purely scientific, though accidents and their treatment are not disregarded. The text is bountifully illustrated by figures and is adorned by some plates of singular perfection.

In reviewing this vast array of facts it best conforms with the aims of this *Bulletin* to follow them as they are presented, group by group.

The fourteen pages on venomous PROTOZOA present nothing particularly remarkable—the trichocysts of Ciliates, the toxin of Sarcocystis, the problematical toxins of the suctorial tentacles of Acinetaria, of protozoon blood-parasites, and of Entamoeba. Of the last-named the account is out of date ; it is treated as unconditionally pathological and separately from *E. tetragena*.

The COELENTERATA occupy 62 pages. Here also we are a good deal on familiar ground—the thread-cells of medusae and polyps, the local and general effects of accidental contact with jellyfish (*Cyanea* and *Rhizostoma* in particular), Portuguese man-o'-war (*Physalia*), and the sea-anemone associated with sponge-fishers. GUERIN's experiments with dried and powdered Physalia are described ; the powder when ingested by animals such as the dog and cat and rat caused symptoms of abdominal distress, vomiting, and often death in convulsions 12 to 48 hours afterwards. The various toxins that have been obtained from notoriously urticant coelenterates, and their physiological effects, are described. The bibliography of stinging-cells and their toxins contains over 100 references.

ECHINODERMS take up 32 pages, wherein are described the structure of pedicellariae and their venom glands, and the toxins obtainable from the ovaries and testes of sea-urchins. The experiments of HENRI and KAYALOFF are quoted as illustrating the toxic effects of pedicellaria-glands ; 40 pedicellariae of *Sphaerechinus granularis* crushed in saline and injected into young rabbits of about 1,500 gm. weight caused death by general paralysis and asphyxia in two or three minutes, the heart continuing to beat after cessation of breathing.

The 76 pages on Parasitic Worms are mainly helminthology and pathology, with the toxic aspects of helminth infestation and the applications of serum diagnosis elaborated.

In the 30 pages devoted to Myriapods the cutaneous glands of millipedes and the venom glands of centipedes are described, and some of the conflicting statements regarding the effects of the bite of centipedes are mentioned. Cornwall's excellent paper on the venom of centipedes (*Ind. Journal Med. Research*, Vol. 3, 1916) is not noticed.

To Arachnida 108 pages are allotted. Here 20 pages are given to the structure and development of the venom apparatus of scorpions and spiders, and 40 pages to different species of spiders and their venom, but only 18 lines altogether to ticks and mites. Scorpion venom is very fully considered in all its scientific aspects. The venoms of scorpions, like those of snakes, are specific; those of some species have analogies with cobra venom, those of others with viperid venom; the venom of a particular species also varies with individual circumstances: these facts no doubt explain the prevalence of controversy regarding the results of sting from a scorpion. Experiments here quoted show that a full-grown guinea-pig may be quite insensible to a dose of 2 mgm. of (dried) venom of a *Heterometrus* (Scorpionid) and be quickly killed by 0·10 mgm. of that of a species of *Buthus*. Scorpion-venoms, like snake-venoms, can be dried and subsequently dissolved in water or saline without loss of virulence. The action of spider-venom is known chiefly by its effects in accidents, but among other things a very full account is here given of Escomel's experimental and clinical observations of that of *Lathrodectes mactans* and of *Glyptocranium gasteracanthoides*. Perusal of these pages will correct any lingering incredulity as to the possibility of serious results from the bite of a spider.

Venomous Insects fill 150 pages, of which the stinging Hymenoptera occupy more than a third. The less familiar matters dealt with are the toxins of Oestrid larvae, of urticating caterpillars, and of vesicating beetles, and the experiments of Dr. C. Phisalix on the limited amount of "immunity" afforded by hornet venom against the venom of the viper.

Venomous and poisonous Mollusca are dealt with in 21 pages. Here the salivary glands of the octopods and cuttle-fishes are described; their secretion is now known to be venomous, quickly and totally paralysing its natural prey after violent preliminary convulsions, and killing warm-blooded laboratory animals in the same way. The salivary secretion of some of the gastropod Molluscs—*Conus* in particular—has long been believed venomous, but nothing very definite is here said on this point. Certain gastropod and bivalve molluscs are dangerous to eat quite apart from any temporary contamination of the water from whence they may have been taken; this is particularly the case with mussels, from which a leucomaine, mytilotoxin, has been separated.

Venomous and poisonous Fishes are examined in 143 pages. The venomous species are defined as those that can inflict a serious wound with spines or—as in the case of some eels—with teeth. More than 60 such species are here mentioned, including piked dog-fish, the sting-rays and eagle-rays so abundant in tropical seas and estuaries, cat-fishes (Siluridae), Scorpaenids, Cottids, Trachinids, toad-fishes, blennies, gobies, globe-fishes and porcupine-fishes, besides several families of Perciform fishes; the venom-apparatus and venom of the more notorious species are dealt with in detail.

A second section of this chapter treats of fishes of which the blood is toxic. Of these there are numerous species, besides the eel. The physiological action of ichthyotoxin is here discussed at great length.

A third section deals with poisonous fishes, which are defined as species that either persistently or periodically elaborate substances causing grave or even fatal consequences to man if the flesh be eaten. This definition is meant to exclude fish that perhaps may accidentally become poisonous through some local peculiarities of their food or feeding-grounds, and fish that may become quickly ptomainous in a tropical climate. Of the

fish considered to be truly poisonous by the definition, over 120 species are here listed and a few figured. They include species of the following groups and families :—Lampreys, sharks, rays, sturgeons, Clupeoids, Cyprinoids, Siluroids, eels, pike, Cyprinodonts, gar-fishes, barracudas, Gadoids, sea-perches, sea-breams, wrasses, mackerels, horse-mackerels, Pleuronectoids, gobies, Scorpaenoids, toad-fishes, frog-fishes, file-fishes, box-fishes, parrot-fishes, globe-fishes, porcupine-fishes, and the sunfish ; some of these, of course, are repulsive looking creatures, and carry the stamp of forbidden food. In respect of the flesh of some of these fishes individual idiosyncrasy no doubt may play a large part.

Venomous Amphibia are treated in 174 pages. The structure and distribution of the venom glands of the skin of the various Amphibia are described. These glands are of two kinds, namely (1) the small *mucous glands* disseminated all over the body, and (2) the *granulous glands* (of which the " parotid " glands of the toad are a good example) which are massed in definitely-arranged formations usually on the dorsal surface of the body. A long account is given of the venoms of both kinds of glands, upon which Madame Phisalix herself is an authority. The " mucous " venoms have a strong analogy with viper venom, and according to C. and M. Phisalix frogs immunized to the former are resistant to the latter ; also rabbits immunized to mucous venom of salamander become to a limited extent refractory to the virus of rabies. The " granulous " venoms are secreted with more physiological labour ; their properties differ in different species of Amphibia. Space does not permit us to notice the several specific granulous venoms here described and discussed at length : it may be sufficient to mention that that of the toad is extremely toxic to both cold-blooded and warm-blooded vertebrates, causing shock, slowing of heart and eventual stoppage in systole, nausea, vomiting, myosis, muscular spasms followed by paralysis and failure of respiration ; and in warm-blooded animals causing also a fall of temperature.

Venomous Lizards (*Heloderma*) engage 45 pages, 16 of which are given to anatomical details. Here, as on the Amphibia, the author draws freely from her own original researches, and she writes with a particular authority from vivid personal experience, having been bitten by a captive Heloderma sixteen inches long. The bite was extremely painful and the bitten finger became swollen and purple. Profuse sweating and vertigo followed in a few minutes. About an hour afterwards, along with a return of sweating and giddiness, a brief fainting-fit occurred. The sweating and the tendency to faint lasted about three hours. Local pain continued for about a week : general asthenia with fits of vertigo, sweating, and sensations of swoon lasted about five months. The author states particularly that there was no nervous shock.

The dramatic interest of this chapter is maintained by an account of a mortal combat between a Heloderma and a large viper. The Heloderma, bitten in the cheek, died after 24 hours, with the usual lesions of viper poisoning. The viper, bitten in the tail, and consequently without injury to any viscus, died after 52 hours.

Venomous Snakes engross 598 pages, of which 22 are given to classification and superficial characters, and 94 to lists and some brief diagnoses of species, arranged according to geographical provenance ; here, among the Asiatic species, we find the notorious *Bungarus candidus* (=*caeruleus*) listed, indeed, but not otherwise noticed. Anatomical details of the venom apparatus and the associated structures fill other 124 pages, and the rest of this big section is devoted to snake-venoms—their properties, physical and chemical reactions, and specific composition ; their specific physiological and pathological effects ; the action of specific toxins and ferments on the blood and several tissues ; immunity, antivenoms, etc. ; and, finally, to treatment of snake-bite, with which is incorporated an account of the various reputed specifics and curatives that have been advocated in different parts of the world. It must be remarked that venomous snakes and snake-venoms are defined in the widest sense, so as to include not only the Viperidae and the proteroglyphous and

opisthoglyphous Colubridae, but also a number of aglyphous Colubridae, Boiidae, Ilysiidae, Uropeltidae, and Amblycephalidae, which, though not possessing grooved fangs, are known to possess either a parotid or an anterior temporal gland; the secretion of the gland is toxic, although there are no special means of injecting it.

The only MAMMAL known to possess a venom apparatus—the male *Ornithorhynchus paradoxus*—occupies 10 pages, compiled from well-known authorities on the subject.

In the final chapter, as also in the introduction to the first volume, the functions and uses of animal venoms are discussed. That in many species the venom is useful for gross attack and defence is obvious, and that venoms may aid in that more subtle form of cellular defence which leads up to natural immunity is most probable; it is more than probable also that they may have various kinds of stimulative influence, like other secretions. The author enlarges on all these points, but does not here say anything about the probable digestive functions of the venom of snakes. She maintains rather a biological outlook, both broad and subtle, and is inclined to regard the manufacture of toxin as a primitive function of general prevalence, and the obviously and potently venomous animals in each zoological group as merely a sort of specialized or privileged caste. To the cynic it may, perhaps, be some satisfaction to reflect that in Nature's livery we all are more or less toxic.

This final chapter ends with some remarks on the therapeutic employment of animal venoms in ancient and modern times, and with an expression of hope that uses may still be found for snake venoms in rational therapeutics—a hope that seems quite justifiable.

This great magazine of well-ordered fact will be a very present help to explorers in a field which, to residents in tropical countries in particular, is of fascinating interest.

A. Alcock.

RODENHUIS (Y.). **Handleiding bij het onderzoek naar Protozoën in de menschelijke faeces voorkomend.** [Manual for the Investigation of Protozoa occurring in Human Faeces.]—*Koloniaal Instituut, Amsterdam.* Mededeel. No. XVI (Afdeeling Tropische Hygiene No. 11). pp. iv+68, 8 plates. 8° Amsterdam. 1921. [Published by the Institute. Price fl. 3.]

In this small and clearly written manual the author has endeavoured to give a concise account of the chief methods employed for detecting protozoa in human faeces; and he has tried, at the same time, to describe these organisms in sufficient detail to enable the inexperienced worker to sort out, classify, and name his findings.

The work is divided into three main chapters, followed by an elaborate tabular key for the systematic determination of the various protozoa described, together with eight double plates, exhibiting 86 half-tone figures of protozoa and other organisms, and a series of curves.

Chapter I deals with the technique of collecting and examining faecal material. The various methods in vogue for making fresh and permanent preparations are briefly reviewed, and three procedures are described for concentrating cysts, when present in scanty numbers in the stools. The last of these—a method devised by BAYER in KUENEN's laboratory in Amsterdam—is worthy of note, as it is not generally known.

The technique is as follows :—1 cc. of faeces is put into a small flask (capacity about 100 cc., and fitted with a rubber stopper), together with 30 cc. of the following solution :—

Cupric chloride	0·6 gm.
Cupric acetate	0·6 gm.
Formol	30·0 cc.
Camphor water	150·0 cc.
Glacial acetic acid	4·0 cc.
Distilled water	420·0 cc.

The mixture is thoroughly emulsified, and then sieved through fine wire netting or gauze to remove the larger particles. The filtrate is then shaken up in a separating funnel with 15 cc. of ether and allowed to stand for several minutes, when most of the faecal detritus rises to the top along with the ether. The liquid remaining below is then drawn off and centrifuged (for three minutes, by hand, at a moderate speed), and the deposit examined under the microscope. A drop of carbol-thionin solution (Nicolle) may be added to the preparation to make the structure of the cysts more distinct; but in the author's experience this is superfluous.

Various well-known methods of fixation and staining are described, but it seems regrettable that no indications are given of their relative values. Some of them are good, but others are, to say the least, poor; and one (drying and staining with methylene blue and eosin) is utterly worthless for studying active protozoa or their cysts in human faeces.

Chapter II contains a few notes on points of diagnostic importance in identifying intestinal protozoa (form, motility, dimensions, structure, etc.).

Chapter III is the longest, and forms a synopsis of the protozoa found in human faeces. Six amoebae, four flagellates, four coccidia, and *Balantidium* are here shortly described. The descriptions are, on the whole, adequate and free from errors, but they contain a few statements which are open to more or less serious criticism. Zoological conventions in the matter of nomenclature are not always, apparently, accepted by the author. We thus find the *Trichomonas* of the gut called "*T. intestinalis*," *Giardia* called "*Lamblia*," and various authorities and names wrongly cited. For example, the reviewer noted, with some surprise, a coccidium named "*Eimeria wenyoni* (Wenyon)"—which unjustly implies that the authority cited named the organism after himself; whilst *E. snijdersi*, a name which the reviewer once proposed, is listed as "n. sp.," implying, of course, that the name is here first introduced by Rodenhuis. These, and several other zoological inaccuracies, might have been avoided if the author had sought competent zoological assistance, and had made himself familiar with the rules of nomenclature. They seem all the more regrettable in view of the fact that several works which should have saved him from falling into such errors are cited in his list of references.

As regards matters of fact or interpretation, the reviewer notes several statements which he regards as incorrect. The author is, apparently, unaware of the part played by the precystic forms in the life-cycle of *E. histolytica*, and KUENEN and SWELLENGREBEL's interpretation of "*E. minuta*" is adopted—an interpretation which is surely no longer tenable. The work of WALKER and others, in this connexion, is ignored. In common with other Dutch workers, the author regards all the strains of *E. histolytica* forming small cysts as belonging to a separate species called "*E. tenuis*." [Even if this were a correct conception, this would not be the correct name to employ.] The various strains of *E. histolytica* are dismissed with the remark that "too little is known of the influence that different factors may have on the dimensions of cysts, for it to be possible to ascribe these differences, with certainty, to a diversity of race." [Such a statement merely ignores the bulk of the evidence adduced by English workers as a foundation for their views; and Rodenhuis's curves —which are given on Plate VIII—cannot be regarded as constituting a serious criticism of their far more detailed and extensive investigations.] It may be noted further that *Iodamoeba* is—as by other Dutch workers—here assigned to the genus *Endolimax*. [Whatever views one may hold as to the naming of this organism, it is certainly not co-generic with *E. nana*—the type species of *Endolimax*.]

Among the flagellates, *Embadomonas* is not described, and is dismissed (under the name of *Waskia*) as a "doubtful" form. [This is certainly a mistake.] "*Tricercomonas*" is included in the same category, but *Enteromonas* [probably the same organism] is described and apparently accepted. The statement that CHALMERS and PEKKOLA have described cysts of this flagellate measuring 4μ in diameter exceeds the observations of these authors, who merely suggested tentatively that certain rounded forms observed might be precystic stages [though, in the reviewer's opinion,

they probably were not]. They neither found nor described cysts. The coccidia are described so briefly as to be little more than mentioned, and not one of the four species noted is named quite correctly.

The concluding 8½ pages of the text are taken up with a complicated tabular key for the identification of the various protozoa enumerated in the preceding chapter. [This appears to the reviewer to have but little practical utility, since only normal or typical forms are considered, and it must be assumed, presumably, that the user of the key knows beforehand that the object to be identified is a protozoon. Such a key is too cumbrous for the protozoologist, who, when he recognizes an object as a protozoon, also knows approximately what sort of protozoon it is; while the beginner, who finds a doubtful "protozoon" in a stool, is almost certain to be led astray or into grave difficulties. For example, a squamous epithelial cell could easily be diagnosed, by an inexperienced worker, as some species of amoeba if he attempted to "run it down" in this table.]

References (63 in number) are given to some of the more recent works consulted—no mention being made of many of the fundamentally important papers on the subject [such as that of WALKER and SELLARDS]. Other bibliographic defects are also unfortunately frequent, and not a single reference is given with full bibliographic data. Moreover, both here and in the text, several proper names are misspelled (*e.g.*, "Alexieff" for ALEXEIEFF, "Swezey" for SWEZY, "Malins and Smith" for MALINS SMITH), and more careful proof-reading would have eliminated occasional typographic errors, which occur throughout. The figures illustrating the text, though numerous, cannot be highly commended; though their shortcomings—from the artistic as well as from the cytological standpoint—seem to have been needlessly exaggerated by the excessive magnification (4,000 diameters) at which they have been reproduced. Several of them, such as the figures of *Balantidium* and *Enteromonas*, convey a very imperfect idea of the structure of the organisms which they are intended to depict.

A highly satisfactory feature of this publication is its numerous omissions, though it is not clear whether these have always been intentional. A considerable band of text-book die-hards—such as the mythical species of "*Cercomonas*," "*Prowazekia*," etc., of the human gut—are here ignored; and as these have been kept alive, in the past, only by frequent transplantation from book to book, one may perhaps venture to interpret this as a hopeful sign that the days of some of the more hardy among them are now numbered. The almost complete absence of reference to the coprozoic protozoa of human faeces is, however, an omission which seems a mistake in a work of this character.

On the whole this little work may be said to fulfil the purpose for which it was designed, though it cannot be regarded as an authoritative zoological guide to the animals with which it deals; and while many workers in the tropics—if they read Dutch—will, therefore, find it a useful laboratory manual, nevertheless they will have to turn to many another work on the same subject if they desire to do more than merely name, more or less correctly, the objects which they find in the protozoological examination of human stools.

Clifford Dobell.

RAVAUT (Paul). **Syphilis, Paludisme, Amibiase. Le traitement d'attaque et les traitements secondaires (préventif, abortif et d'entretien).**—ix + 213 pp. 1922. Paris: Masson & Cie, Éditeurs, Libraires de l'Académie de Médecine, 120, Boulevard Saint Germain. [Price 9 fr. net.]

A useful and suggestive little volume by a well-known author dealing with the therapeutic treatment of syphilis, malaria, and amoebiasis. At first sight the grouping together of three diseases, so different in aspect,

appears unusual, and this procedure would not find acceptance with biologists, but the figure of speech on page 15 of *Spirochaeta pallida* "encysting itself" in certain regions indicates that the work is written with clinical rather than strictly biological intention. The war enabled Dr. Ravaut to study chronic malaria and amoebiasis on a large scale, as he had already studied syphilis, and on the common ground of parasitism and clinical evolution he treats them all together.

There is here nothing new or original in the treatment of the acute manifestations of malaria and amoebiasis, nothing to appeal greatly to practitioners dealing with tropical diseases in countries where they originate; the book nevertheless will be of interest to a large number of medical men on this side of the channel.

EHRLICH's Therapia Sterilisans Magna doctrine finds no disciple in Dr. Ravaut, who ardently holds that a complete cure is to be sought on well-considered lines and by the prolonged use of remedies after the causal organism has been silenced by specific drugs; but EHRLICH's theory that in trypanosomiasis one strain of an organism may be "fast" to a drug which acts as a specific to another strain of the same organism Dr. Ravaut vigorously applies to syphilis, amoebiasis and, in a lesser degree, to malaria. He maintains that the combination of two or more drugs complementary renders them less toxic and more efficient; that, for instance, in the treatment of syphilis the maximum efficacy and safety is obtained by the simultaneous use of novarsenobenzol and mercury. With regard to safety, English operators have had remarkable freedom from the untoward incidents which sometimes attend the intravenous administration of N.A.B., especially hepatic, by giving glucose before or with the injections.

Dr. Ravaut lays down definite rules of treatment for syphilis, but holds the pessimistic view that no one can be said to be cured. The negative Bordet-Wassermann reaction must be obtained and maintained, but the Bordet-Wassermann reaction is unreliable for the direction of treatment. The fallibility of the Wassermann test on the blood may be admitted, but Dr. Ravaut's severe criticism goes rather too far in the opposite direction and tends to shake confidence in a laboratory aid which, when considered with clinical facts, serves a useful purpose. He uses the cerebrospinal fluid for the Bordet-Wassermann tests. He says there is no way of estimating the intensity of the infection in syphilis; of the modification of the Sachs-Gorgi reaction by Vehrne, or the Dreyer-Ward method, no mention is made.

In malaria he holds that cases which have not been "sterilized" before the Plasmodium has taken refuge in the deep organs require rigorous and sustained treatment. Like English authorities, he regards quinine as the only specific; its failure is due to its non-absorption or to insufficient dosage. He might have added a third cause of failure, absorption at irregular intervals and in varying amounts. He disapproves of intramuscular and subcutaneous injections. Intravenous injections are excellent, but require the daily attendance of a doctor. Quinine by mouth and in solution is the most practical and convenient method.

In the treatment of haemorrhagic forms of malaria (including haematuria) small doses of N.A.B. given intravenously in association with quinine by the mouth have given him excellent results.

In the laboratory examination of malaria Dr. Ravaut does not appear to lay great stress on the differential count of the white blood cells. The value of the relative proportion of the large mononuclears in chronic malaria has lately been questioned by certain English and American workers, and on this point Dr. Ravaut's views in more detail would have been interesting.

Amoebiasis, he states, was considered an alien disease before the war, and was therefore overlooked in France, as in England. The value of microscopical and other examination of the faeces, both for diagnosis and treatment, has not been sufficiently recognized. In the treatment of this

disease methods and drugs should be well chosen. Emetine is appropriate only for the acute stages, and Dr. Ravaut regards Bismuth-Emetine-Iodide as an unpleasant drug for the robust and a dangerous one for the weak; he has not obtained from it the good results of some English observers. Intravenous and intramuscular injections have little effect on the cystic forms of the parasite. Arsenic by the mouth (especially N.A.B.) is very useful.

Ipecacuanha is sometimes more thorough and lasting in its action than emetine. "Ravaut's Paste" is fully described, and the author claims that used on alternate days with N.A.B. (by the mouth) on intervening days, it is really efficacious in chronic amoebiasis, including "carriers" without symptoms. Practitioners in England who have used Ravaut's paste will probably endorse his opinion.

Dr. Ravaut lays little stress on bed and diet in the treatment of chronic amoebiasis. Eggs, milk, and uncooked vegetables are harmful; otherwise a patient may have what he likes and can digest. There is probably a good deal of wisdom in this; the general condition of the patient must be studied.

One is struck when reading the book by the rarity of the references to recent work of English writers, an omission probably due to the fact that the author does not know English.

One welcomes the appearance of this little treatise, with inexpensive cover, clear print and quite good enough paper, which can be purchased for as small a sum as nine francs.

J. B. Christopherson.

EPPS (William). **Anderson Stuart, M.D., Physiologist, Teacher, Builder, Organizer, Citizen.**—pp. xi + 177. With 21 plates. 1922. Sydney: Angus & Robertson Ltd., Publishers to the University. [Price not stated.]

This is an interesting record of a man in whom high intellectual endowments and attainments were combined with imagination and with extraordinary force of character, to the benefit of his fellow citizens and also of the medical profession in New South Wales.

After a distinguished career at Edinburgh University, where, as a student, he gained the Ettles scholarship for the first place on the list of medical graduates of his year, Thomas Anderson STUART was appointed Professor of Anatomy and Physiology in the University of Sydney. On joining his post in 1883, he found a medical school in merest rudiment—his "chair" was located in one of the four rooms of an unfinished cottage that gave the school a local habitation; his staff consisted of a superannuated coach-driver who did not mind handling dead bodies; his teaching apparatus seems to have been represented by a borrowed skeleton; and his class was composed of four students. He appears to have faced the situation with extraordinary spirit and determination, for in six years' time he was teaching a class of from 50 to 60 students in a well-equipped annexe to the University, which annexe had come into existence, "a handsome structure in Tudor Gothic," mainly as a result of his own initiative and pertinacity: out of the four-room rudiment had been developed a medical school worthy of a university. But this, for Anderson STUART, was only a beginning. In 1908 he was planning additional buildings, which ultimately doubled the size of the medical school; and by 1920—the year when this remarkable Professor and Dean of the Medical Faculty died—the school provided accommodation for 1000 students and the requisite teaching establishment, and had indeed become "the largest medical school in Australia," comparing "very favourably with the great medical school buildings of the United Kingdom." Long before this his purely professional responsibilities had become confined to the single subject of physiology.

Other public activities—academic, sanitarian, educational, social—occupied a large amount of this notable life, but the creation of this medical school and, incidentally, the development of its clinical strength in a magnificent extension of the Royal Prince Alfred Hospital is the great achievement and the monument.

The spirit and ideals that animated this great achievement are well illustrated in the following autobiographical passage: "I believe that my influence in this direction has been of considerable value to the profession of medicine, in raising it to its present high standard and social influence in Australia, where it occupies a leading position. In Australia the medical man has been a university graduate from the very beginning, and there have been no colleges or corporations of secondary importance to mar the influence of the university. In my opinion the general level of professional capacity in Australia is much higher than it is in the old country, partly because of the generally higher education of the medical man and partly from the fact that so many medical men are thrown upon their own resources by reason of their isolation . . . hundreds of miles away from specialists."

The author of this "Life" says that no enterprise designed or organized by Sir Thomas Anderson STUART, has ever—once accepted—had to be abandoned or materially altered in execution, so clear was his foresight and so comprehensive was his attention to detail. It is perhaps unfortunate that his scheme of a Department of Tropical Medicine in connection with the Medical School of the University of Sydney was not accepted.

A. Alcock.

The Practice of Medicine in the Tropics. Edited by BYAM and ARCHIBALD. Vol. II.

The writer desires to correct an error he has made in his review of Byam and Archibald's "Practice of Medicine in the Tropics," which appeared in the last issue of the Bulletin, page 535. This has reference to the dates quoted in the article on Spirochaetosis by Archibald. The date of EHRENBERG's creation of the genus *Spirochaeta*, as pointed out by DOBELL (1918) [On the Nomenclature of the Spirochaete of Syphilis. *Medical Research Committee, Special Report Series*, No. 19, p. 47 (London).] is correctly stated as 1834. EHRENBERG's paper was read in 1832, but was not printed till May, 1834, though EHRENBERG himself (1838) incorrectly quotes it as 1833. The date on the title page of the volume (*Abhandlungen der Königlichen Akademie der Wissenschaften zu Berlin, Aus dem Jahre 1833*) is given as 1835. It appears that EHRENBERG's paper was printed and issued separately in May, 1834, and not incorporated in the volume till 1835.

KLEBS' genus *Spironema* was founded in 1892, not 1893. The paper (*Flagellatenstudien I—Zeit. Wiss. Zool.*, Vol. 55, Heft. 2, pp. 265–351) is included in the volume which bears the date 1893, but this and other papers in the volume appeared on December 20 1892, and were included in the 1893 volume. The second part of the paper (*Flagellatenstudien II—Ibid.*, Heft. 3, pp. 333–445) appeared on December 30, 1892.

The writer very much regrets having criticized the date 1834, which Archibald correctly quotes. The main point, however, stands: it was not the genus *Treponema* which KLEBS founded, but the genus *Spironema*

C. M. Wenyon.